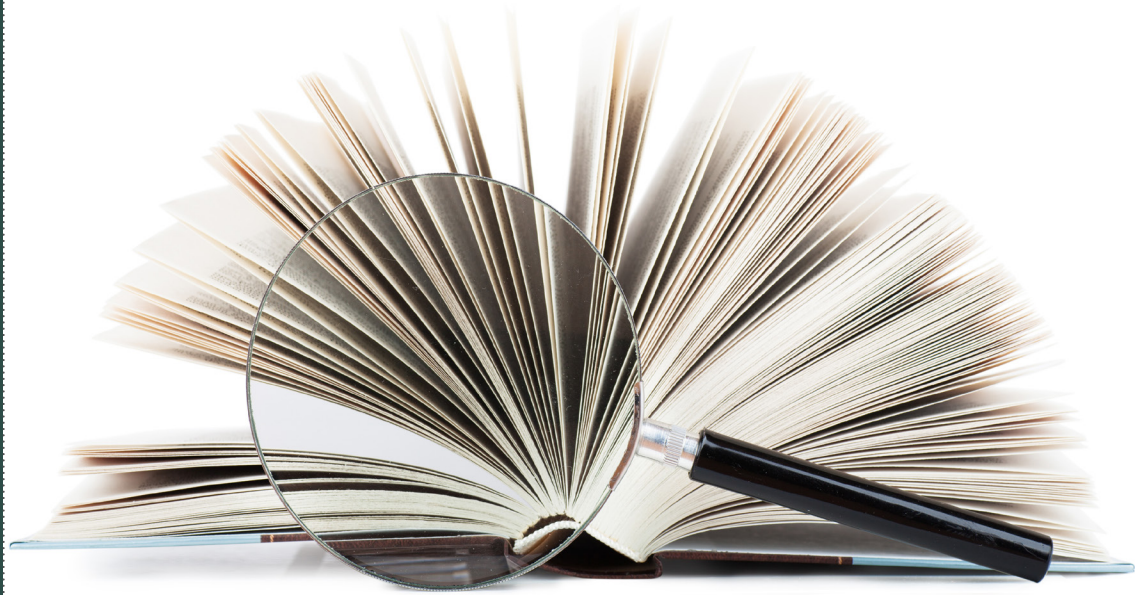


Micro-Credentials

Trends in Credit Transfer and Credentialing

Prepared for BCCAT by Joanne Duklas, Duklas Cornerstone Consulting Inc.

November 2020



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Table of Contents

EXECUTIVE SUMMARY	1
INTRODUCTION	4
REPORT DEFINITIONS	5
RESEARCH APPROACH	6
FINDINGS	7
Micro-credentials: Exploring the Definitional Variety	7
Micro-credentials and Digitization	13
Exploring the Quality of Micro-Credentials	14
Current and Emerging Exemplars of Micro-Credentials	16
Canadian Examples:	16
International Examples	18
Portability and Technology	19
Survey and Interview Findings	22
Survey Respondent Cohort	21
Micro-Credential Providers	23
Definitions and Nomenclature	23
Defining Characteristics of Micro-Credentials	25
Learning Experience Being Credentialed	27
Motivations for Developing Micro-Credentials	28
Micro-Credentialing Source	29
Approval Authority for Micro-Credentials	30
Considering Micro-Credentials for Admission or Transfer	31
Transcription Practices	31
Exploring the Human Resources Specialists' Perspectives	32
Overarching Considerations	34
Suggestions for Additional Research	35
MOVING FORWARD	36
Establishing Shared Definitions	36
Aligning Micro-credentials with Existing Quality Assurance Processes and Contexts	37
Creating a Credential Registry	37
Establishing Industry Partnerships	37
Aligning Micro-credentials with Existing Recognition of Prior Learning Processes	37
Creating Communities of Practice	38
Implementation Checklist	39
FINAL CONCLUDING REMARKS	40
BIBLIOGRAPHY	42
APPENDIX A: DEFINITIONS FOR MICRO-CREDENTIALS	46

List of Tables

TABLE 1: Defining Characteristics of Micro-credentials	11
TABLE 2: Type of Learning being Credentialed	12

List of Figures

FIGURE 1: Vertical Stacking	8
FIGURE 2: Horizontal Stacking.....	8
FIGURE 3: Complementary Stacking.....	9
FIGURE 4: A Sample of National Level Credential Exchange and Validation Service Providers in Higher Education.....	14
FIGURE 5: Example of Decision Milestones Impacting Micro-Credentials - Post-secondary Admission and Transfer.....	15
FIGURE 6: Geographical Diversity of Respondents by Percent (n=90).....	22
FIGURE 7: Types of Organizations Represented in the Survey by Percent (n=90).....	22
FIGURE 8: Percentage of Respondents from Institutions with or without a Working Definition for Micro-credentials by Organization Type (n=90).....	23
FIGURE 9: Terminology Used to Describe Micro-credentials at Post-Secondary Institutions by Percentage (n=18).....	29
FIGURE 10: Micro-credentialing Terminology in Use by Institutional Type and Percentage (n=18).....	25
FIGURE 12: Defining Characteristics of Micro-credentials by Institution Type and Percent (n=18).....	26
FIGURE 13: Learning Experiences Credentialed in a Micro-credential (n=18).....	27
FIGURE 14: Motivations for Offering Micro-credentials (n=19).....	29
FIGURE 15: Departments within a Post-Secondary Institution that Oversee Awarding Micro-credentials (n=18).....	30
FIGURE 16: Internal Approval Authority for Micro-credentials, Percentage of Respondents (n=18).....	31
FIGURE 17: Micro-credentialing Awarded to Employees by Organizations, Percentage of Respondents (n=90).....	32
FIGURE 18: Plans to Adopt Micro-credentials, Percentage of Respondents (n=90).....	34

Executive Summary

A plethora of micro-credentialing research and pilots are underway across Canada and around the world led by academic researchers, government, and industry. The intensity is creating a perfect storm of opportunity that is reframing assessment practices. Exploring their utility for admission and transfer into higher education, the focus of this study, represents a gap in the research.

Four objectives defined the scope of this research:

1. Identifying and reviewing current and emerging practices in developing and accepting micro-credentials in admissions and transfer in British Columbia and elsewhere;
2. Assessing institutional perspectives on motivations, issues, and opportunities for developing and using micro-credentials for admissions and transfer at post-secondary institutions in BC, Canada and beyond;
3. Exploring employers'/ human resources staff perspectives on micro-credentials in the labour market, to the extent information was available and accessible; and
4. Identifying areas for future research and, if appropriate, the development of practices.

The report provides insights into current micro-credentialing practices, motivations, and perspectives at Canadian higher education institutions and beyond. The research approach included conducting eight interviews with higher education micro-credentialing experts, including those situated within Canadian post-secondary institutions; a national, bilingual survey that had a 90% response rate with 90 participants; and an environmental scan of the literature and web information for micro-credentials.

Nomenclature

Defining micro-credentials became an early challenge in the project. The literature review and environmental scan provided insight into this variety and identified some consistent themes. The many different forms of micro-credentials create further confusion (e.g., badges, certificates, e-portfolios, tokens). As imprecise nomenclature can be an impediment to achieving clarity, survey and interview questions explored participants' perspectives and examples of defining characteristics and definitions for micro-credentials.

The report lists examples of micro-credential definitions from Canada and beyond, and suggests specific, more aligned definitions. At their core, micro-credentials provide validated evidence of what a person knows and can do in a focus area, skill, or competency at a granular level; these credentials tend to be very specific to purpose (e.g., to aid access and transition to the workforce in a particular industry).

Assessing and Transcribing Micro-Credentials

As a relatively new concept for Canadian post-secondary institutions, accessing transcript examples for micro-credentials proved to be a challenge. Unfortunately, only one was provided; however, this was supplemented by survey questions about transcription practices. The study results indicated that most of these credentials were awarded through continuing education departments and thus outside of student information systems or at the program level such as through or outside of learning management systems. Most are disconnected from the regular institution wide, quality assured credentialing framework and enterprise level student record systems. Institutions do transcript courses which may be part of the learning that led to a micro-credential. However, most admission and transfer credit assessment processes appear blind to whether a student or applicant presented a micro-credential. As the source and the quality assurance context for these micro-credentials tend to be ambiguous or not well known, credential evaluators (including faculty) appear to disregard them when assessing admissions and transfer credit for post-secondary consideration. The study did find examples of institutions that do grant admission and transfer for micro-credentials but the practice is not wide-spread.

When micro-credentials represent learning that is transcribed (e.g., as courses), they could be used for admissions or transfer by Canadian post-secondary institutions. Some institutions referenced existing certificate programs and suggested these, once credentialed, represent a form of micro-credentialing of formal learning. As these tend to be part of approved, quality assured programs, these could be and likely are used by institutions to support admission and transfer assessment, if the learning is represented explicitly on the transcript.

Purposes of Creating Micro-Credentials

The most common intentions for creating micro-credentials involve providing credentialed recognition for *what a person knows and can do* at a modular level. Typically, the qualification is designed to present a recognized and official symbol of the learning experience to enhance access to and within the workplace.

While our survey identified “access to future studies” as the top motivation for developing micro-credentials, it was not supported by significant evidence of micro-credentials being used in transfer and admission processes. There was no evidence of a strong connection to motivations focused on designing these credentials to support future admission, transfer, and stackability. This suggests a missed opportunity and an area ripe for future development.

Interviewees and survey respondents indicated that micro-credentials represented an opportunity to enhance prior learning assessment practices for admission and potentially even transfer and saw the potential for micro-credentials to enhance recognition and scalable assessment of prior learning.

Exemplars of Micro-Credentialing

The report provides several examples both within Canada and internationally of promising practices in the field of micro-credentialing. As this research focused on admission and transfer, notable Canadian exemplars include Thompson River University's recent innovation with micro-courses in support of the Open Education Resource universitas (OERu),¹ Simon Fraser's FASS Forward microcredit courses,² Algonquin College's Micro-credentials Framework,³ and the New Zealand Qualifications Authority's work to systematize and embed micro-credentials into the country's quality assurance framework.⁴ The latter, along with the US-based Credential Engine's⁵ online registry provide scalable, system level mechanisms for supporting the quality assurance credential ecosystem. eCampusOntario's work to support pilot projects in Ontario (emphasizing the importance of transcription as part of its framework), serves as a helpful system level example that is incentivizing change.⁶ The State University of New York's robust definition for micro-credentials stands out for its nuanced quality considerations, a necessary antecedent for successful adoption of these credentials in admission and transfer processes.⁷

Institutional Perspectives

One quarter (22%, 18 of the 81 institutional respondents) of survey respondents indicated they were exploring micro-credentials. In some instances, these respondents currently award admission and transfer credit. A subset of respondents do so primarily to facilitate transition to and within the workplace or to recognize competencies achieved through co-curricular experiences. Some seek to use micro-credentials to evidence skills and competency beyond learning that is captured in traditional diplomas and transcripts. Micro-credentials such as digital badges are also offered to students to highlight focused learning achieved through their program that is of relevance to their field of study. Continuing education departments at Canadian post-secondary institutions appear to be leading the way with micro-credentialing and, in many instances, are establishing alternative partnerships with industry, sometimes aided by government incentive funding.⁸

¹ <https://inside.tru.ca/releases/thompson-rivers-university-takes-lead-role-in-global-education-accessibility/>

² <https://www.sfu.ca/fass/students/current-students/undergraduate-students/fassforward.html>

³ <https://www.algonquincollege.com/microcredentials/framework/>

⁴ <https://www.nzqa.govt.nz/providers-partners/approval-accreditation-and-registration/micro-credentials/>

⁵ <https://credentialengine.org/>

⁶ <https://www.ecampusontario.ca/micro-certifications/>

⁷ <https://system.suny.edu/academic-affairs/microcredentials/>

⁸ The government funded eCampusOntario projects represent recent examples of these types of initiatives.

Digitization

The study reveals that micro-credentials are available in both digitized and non-digitized formats. However, digitization represents a growing area of interest. Some of those interviewed were embracing blockchain as the potential solution to support accessible, just-in-time access for learners to their micro-credentials. With advances in technology and mainstream digitization of all manner of parchments and documents in higher education that leverage blockchain and data exchange models, digitization has become the new baseline for portability, access, and self-sovereign credentials. As such, it is no longer exclusive to micro-credentials.

Employer Perspectives

The researchers explored the extent to which institutions distribute micro-credentials to their own employees and faculty/course instructors and whether these same institutions use these during their own admission and transfer assessment processes. The researchers found some examples where micro-credentials were awarded to institutional employees; however, the data findings were too small to support robust analysis for admission and transfer. This represents an area of future research.

Additional Research

There have been several research and consultation projects underway or planned in Canada to better understand micro-credentials. Samples included exploring how they fit into the higher education credentialing context and qualifications frameworks; what type of learning should be represented; how to evolve campus capacities to create and deliver micro-credentials (Presant, 2020); how they should be defined (see Appendix A for examples); what principles should guide their development and who should establish these principles; and what role, if any, government should play to incentivize usage. Several future research topics are suggested along with a recommendation that they be explored at a national scale:

1. How closely are existing micro-credentials tied to established educational quality assurance procedures for program development, delivery, and review? Should they be, or in what circumstances should they be, and would this represent a distinguishing factor to aid their utility for admission, transfer, and stackability?
2. What might be the implications of expansion of existing credential frameworks to include micro-credentials? Is this necessary in order to advance adoption of micro-credentials for admission and transfer assessment processes?
3. Where is responsibility and stewardship of micro-credentials situated within higher education organizations, and what are the implications of different approaches for transcription, admission, transfer, and stackability of the credentials?

Final Thoughts

Examining micro-credentials through the lens of admission and transfer suggested that an opportunity exists to focus motivations and ensure that the purpose of providing access is clearly articulated, even in the design stage. Embedding a focus on admission and transfer from the outset represents an opportunity for micro-credentials. The practice of admission and transfer assessment is heavily informed by best practice considerations, conventions, and quality assured metrics. If a micro-credential is to be used effectively for mainstream adoption in admission and transfer assessment, important questions need to be asked and answered. These processes typically demand information on which institution or organization delivered the credential, the supporting quality assured process, what assessments were used, etc. The report provides several examples to support future next steps for micro-credentials.

Micro-credentials can and should contribute to admission and transfer, but doing so requires focus, quality assurance, and intentional design that considers access pathways to future studies. System level support can be an enabler to encourage adoption into mainstream assessment practice. An implementation checklist for micro-credential design is provided in this report.

Introduction

Interest in micro-credentials is growing rapidly in Canadian higher education, in concert with a desire to find new methods for delivering, assessing, and credentialing skills and competencies. This interest, incentivized in part by institutional mandate, as well as government and industry funding, has driven several micro-credentialing projects already underway across Canada. Recognized post-secondary institutions are separately or in partnership with industry, providing learning experiences and subsequent credentials that represent a subset of formal recognized learning, learning offered through continuing education departments at post-secondary institutions (i.e., not necessarily recognized for transfer credit and admissions into post-secondary studies), and intentional workplace learning.⁹ At times, the credentialed experiences straddle two or more of these learning opportunities.

There is a strongly held perception that diplomas and transcripts lack the capacity to represent the breadth and depth of learning provided in and beyond post-secondary institutions. Canadian higher education institutions offering or exploring micro-credentials appear to focus primarily on those credentials that facilitate transition to and within the workplace. Continuing education departments at these institutions appear to be leading the way in the micro-credentialing field to advance recognition received, either through their own programming or through industry partnerships.

Informed by this context and with the support of funding from the *British Columbia Council on Admissions and Transfer* (BCCAT), the researchers explored if and how micro-credentials might enable admission and transfer into Canadian post-secondary institutions, a current gap in the research.

The following objectives informed the research:¹⁰

1. To identify and review current and emerging practices in developing and accepting micro-credentials in admission and transfer in British Columbia and elsewhere;
2. To assess institutional perspectives on motivations, issues, and opportunities for developing and using micro-credentials for admission and transfer at Canadian post-secondary institutions;
3. To explore human resource perspectives on the use of micro-credentials in the labour market (assuming available information);
4. To identify areas for future research and, if appropriate, the development of future practices.

⁹ Terms such as recognized learning or recognized post-secondary institution, formal recognized learning, informal learning, and intentional workplace learning have specific meaning in this report and are explained in the section 'Report Definitions' below.

¹⁰ It is important to stress that the scope of this research focused primarily on those micro-credentialing opportunities that improve access to post-secondary studies through admission and transfer. The researchers did not seek to examine the full range of micro-credentialing opportunities and definitions although some details are provided to aid context setting.

Report Definitions

The following terms have specific meaning in this report and are provided to aid interpretation of the findings.

Formal Educational Learning/Formal Learning – learning in a recognized institution that is *organized, structured, and supported by learning objectives* (OECD, 2019). In the context of this research, formal learning is further defined as learning that *leads to a qualification awarded by an educational institution (e.g., a baccalaureate degree or college diploma)* (Duklas et al., 2015).

Informal Learning – unorganized and unintentional learning received from experiences with no established learning outcomes (OECD, 2019). For this research, informal learning includes knowledge gained from *life and work experiences outside of structured learning contexts* (Duklas et al., 2015).

Non-formal Learning – somewhat organized learning that may have learning objectives (OECD, 2019).

Intentional Workplace Learning – organized structured learning in the workplace that may lead to a credential (Duklas et al., 2015).

Digital badge – *a visual representation of a credential that is displayed and verified online*. A digital badge might also represent other forms of achievement. When the badge is clicked on, a page will pop up that will typically explain what the badge represents, how it is earned, and so forth. (Association Trends, 2018)

Recognized Post-Secondary Institutions – *an academic institution that is granted the [authority] to award academic credentials (e.g., certificates, diplomas, degrees) by a provincial or territorial government in Canada such as through formal legislative act and that is subject to quality assurance expectations and subsequent review as appropriate to institutional type, sector, and jurisdiction*. It includes institutions such as universities, CEGEPs, institutes, colleges (Duklas & Pesaro, 2015).

Micro-Credential - a qualification that represents assessed achievement of a subset of learning within and beyond the traditional realm of certificates, diplomas, and degrees. These provide credential recognition for *what a person knows and can do* at a modular level. The learning experience can occur within a recognized post-secondary program, in the workplace, in other settings, or be a blend of two or more of these. Typically, the qualification is intended to present a recognized and official symbol of the assessed learning experience to enhance access to and within the workplace. More details on this definition are contained below.

Stackable credential - *a credential that is part of a learning sequence that can be accumulated over time to build up an individual's qualifications and help that individual move along a career pathway to further education, different responsibilities and potentially higher-paying jobs* (Lumina Foundation, 2015, p. 12).

Research Approach

The research employed the following methods for this study:

- A national, bilingual survey targeting higher education institutions across Canada. The survey targeted higher education institutions primarily (i.e., registrars and continuing education divisions) and was selectively delivered to international experts in the field of credentialing during the fall and winter of 2019/20. The survey included closed and open-ended questions to provide freeform input and used a Likert scale for opinion-based questions. Given the focus on British Columbia, it was sent to public and private post-secondary institutions that are members of the BC Transfer System, and to similar institution types across Canada. The survey instrument is available as Exhibit A. Ninety (90) individuals participated in the survey.
- Eight qualitative interviews containing structured questions with institutional representatives and micro-credentialing experts; and
- A literature review/environmental scan. The review included scholarly and trade literature, a review of the websites of institutions that are exploring or awarding micro-credentials, and an assessment of other white papers and research to provide additional insights on the perspective of employers/human resource staff. The micro-credential definitions from this review are included as Appendix A.

Findings

Micro-credentials: Exploring the Definitional Variety

The literature review and research found a lack of consistent definitions for the term *micro-credential* suggesting a universally understood and adopted definition does not exist although there is evidence of thematic consistencies and select frameworks and principles (Appendix A). This gap presented an opportunity to include questions in the survey to allow respondents to share their definitions and defining characteristics in use at their institutions and organizations.

The most common core defining features of these credentials are that they provide recognition of:

- what a person knows and can do at a modular level in a very specific focus area;
- learning achievement that has been verified and assessed by a trusted source; and
- skills and competencies gained from formal, non-formal, and/or informal learning experiences that are specific to purpose.

As an example of specificity of purpose, a micro-credential is often seen as a vehicle to enhance access to and within the workplace. Two apparent definitional themes are apparent. The first theme identifies the defining characteristics of the credential, i.e., what makes it a *micro-credential* (Table 1), and the second theme suggests the type of learning and/or assessment being credentialed (Table 2). Those definitions in the former category used descriptors such as digitized or both digitized and non-digitized (the latter suggesting that digitization is not a defining characteristic); officially verified by the issuer and/or by other parties (i.e., externally recognized); shareable, portable, and user controlled; relevant to the workplace; accessible on demand; stackable (i.e., linked to other micro-credentials which, if taken successively, facilitate advanced certification in a focused area) or standalone and unconnected; and complementary to or part of an existing degree or diploma program.

Stackability represents an interesting concept for micro-credentials and demonstrates their versatility. Three types of stacking exist: vertical, horizontal, and complementary stacking (Figures 1-3).¹¹ Micro-credentials could potentially contribute to any of these three scenarios demonstrating their alignment to existing academic diplomas and degrees and their potential for aiding admission and transfer assessment. The following three visuals help to illustrate the concepts.

¹¹ Some sources reference vertical, horizontal, and 'value-added' (Utah System of Higher Education, 2015). Since one would imagine most options add value, complementary is used in this report.

FIGURE 1: Vertical Stacking

Vertical stacking involves combining one credential with another to achieve a successively higher credential.

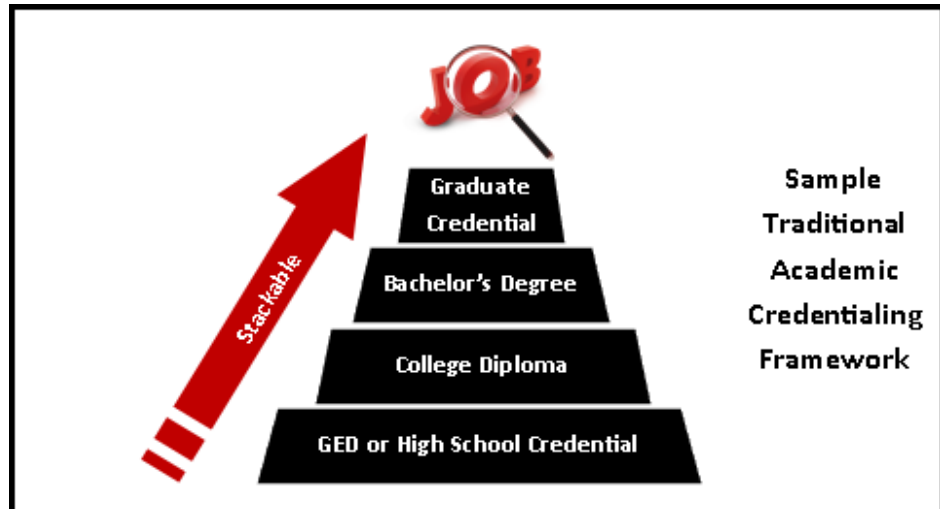
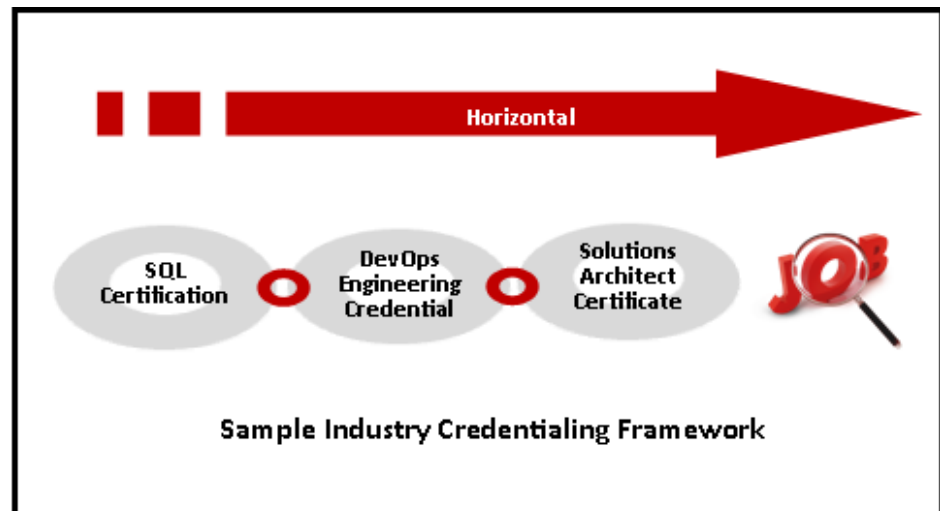


FIGURE 2: Horizontal Stacking

Horizontal stacking occurs when many credentials are pursued in related fields that collectively support achieving access to an occupation.



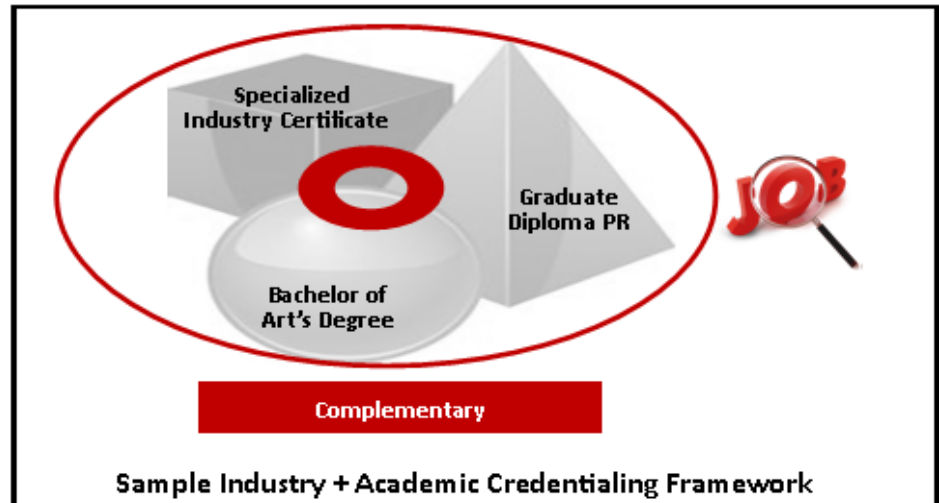
As a support to transfer and mobility, select higher education organizations and institutions have sought to create frameworks that embed micro-credentials from trusted sources within the spectrum of acceptable learning artifacts when assessing or presenting a candidate's learning (Algonquin College, 2020; Duklas & Bridge, 2017). Oliver's (2019) work articulates and examines credit bearing micro-credentials and does an excellent job of amplifying the importance of trust and quality to support adoption and use of micro-credentials in admission and transfer. This innovative effort benefits learners, and is inspired and enabled by advances in technology and a focus on learner-centred education delivery (Duklas & Bridge, 2017).

For the purposes of this research, micro-credentials mean a qualification that represents assessed achievement of a subset of learning within and beyond the traditional realm of certificates, diplomas, and degrees which some reference as macro-credentials (Association Trends, 2018). Oliver's (2019) definition provides further insights that are relevant to the current research.

...a micro-credential is a certification of assessed learning that is additional, alternate, complementary to or a formal component of a formal qualification.... credit-bearing micro-credentials include assessment aligned to a formal qualification level. Achievement of the learning outcomes leads to an offer of admission to or credit towards at least one formal qualification, regardless of whether or not the offer is taken up by the learner. Credit-bearing micro-credentials mirror and contribute to the academic standards required in the target qualification(s). The duration and effort required by the learner are in keeping with amount of credit earned in the target qualification(s).

FIGURE 3:
Complementary Stacking

Complementary stacking is more organic and involves adding expertise in a related or complementary area and bundling credentials to better prepare for employment or further studies.



This research found evidence that a micro-credential in the post-secondary context can represent recognition for learning achieved in any of the following situations (Table 2):

1. Learning received through participation in a subset of courses or studies within or alongside of a degree or diploma program, all of which has been subject to internal and external quality assurance vetting (i.e., representing a subset of a formal learning experience).
2. Learning received through continuing education programs, including in partnership with industry (often available at post-secondary institutions but outside of the quality assured academic program review framework).
3. Learning obtained outside of the classroom in organized programs within postsecondary institutions but outside of the academic or continuing education context (i.e., through informal learning experiences or co-curricular learning activities¹²).
4. Learning that crosses the boundaries of any of the above categories (potentially possible depending on the policies and practices of the institutions and organizations involved).
5. Assessment of prior learning achieved across multiples contexts using a systematic assessment methodology (e.g., through recognition of prior learning (RPL) assessment processes).

Several examples and models exist beyond the post-secondary institutional context and fall outside of the scope of this research; however, they hold the promise of enabling admission and possibly future transfer credit.

According to the previous research, micro-credentials include a variety of credentials, for example, digital badges, e-portfolios, verified certificates, and *nanodegrees* (Willis et al., 2016). However, nomenclature inconsistencies exist when describing them. The two most common terms in use appear to be *badging* (or *badges*) and *micro-credentials*; however, the terms appear to be used interchangeably. In addition, researchers sometimes use the term *alternative credential* to reference micro-credentials (Buban, 2017; Duklas & Bridge, 2017).¹³

¹² The [ARUCC Transcript and Transfer Guide](#) indicates Co-Curricular Activities are developed with the intention to encourage and incentivize engagement and develop competencies and skills in students. In the context of postsecondary institutions, these activities are intended to enhance learning, encourage self-awareness, and foster an individual that demonstrates exposure to civic responsibility and engagement. These activities are typically linked to competencies, skills, abilities and/or knowledge and, ideally, tracked and validated on an institutional artifact other than an Academic Transcript (Adapted from Elias & Drea, Winter 2013)

¹³ The Lumina Foundation in its *Connecting Credentials Framework* defines alternative learning as learning received outside of the traditional educational institutions to acquire competencies. Some examples cited include Massive Open Online Courses (MOOCs), Prior Learning Assessments (PLAs), apprenticeship learning, workplace learning, and self-directed learning (Lumina, 2015, p. 10). Interestingly, although micro-credentials are mentioned in the Framework, a definition is not provided.

Duklas & Bridge (2017) identified a typology of credentials in North America using a case-based approach that examined several institutions. These researchers identified seven primary credentialing categories relevant in the higher education context - *Certificates and Diplomas* (including graduate and undergraduate degrees, diplomas and certificates); *Academic Transcripts*; *E-portfolios*; *Comprehensive Learner Records (CLR)*; *Co-Curricular Records (CCR)*; *Complementary Records*; and *Cognitive or Skills Recognition Credentials (CSRC)* such as Cognitive Skills Stamps and Badges. In this suggested typology, badges and micro-credentials fall under the broader heading of *Cognitive or Skills Recognition Credentials (CSRC)*.

Within that framework, micro-credentials are sometimes referred to as credentials that recognize professional learning and demonstrate competency in a particular skill (Ryerse, 2017). They are considered a credential that *verifies, validates, and attests that specific skills and/or competencies have been achieved* (State University of New York, 2018). Defining characteristics of micro-credentials often cited in the literature and by institutions include references to them being competency-based, narrowly focused, flexible, convenient, affordable, personalized, self-directed, available on demand, relevant to the employment context of the learner, and focused on learning outcomes achievement (Ryerse, 2017; Buban, 2017; Pipin, 2018; State University of New York, 2018).

The Canadian federal Treasury department's initiative called the *Free Agent Program* represents an interesting example (Guay, 2018).¹⁴ In this model, human resource professionals within the government conduct various structured assessments to determine an individual's capacities across 14 different attributes such as innovation, problem solving, and creativity. Upon successful completion, the learners receive official recognition as Free Agents, a micro-credential through the blockchain, and flexible access to several roles within the federal government, allowing them to move around more freely.

Ontario provides another Canadian example stewarded by eCampusOntario, a provincial government-funded non-profit organization guided by a mandate focused on online and technology-enabled learning. This body created principles and a framework for micro-certification¹⁵ and is overseeing a funding envelope to incentivize institutional and industry partnership initiatives in micro-certification to support workplace transition. According to their website, *micro-credentials (which they reference as micro-certifications) can be used to recognize both vertical and transversal skills. Coupled with the in-depth learning obtained in a field of study, micro-credentials can be used to present a more holistic view of an individual's abilities and achievements.*¹⁶

In the context of admission and transfer credit, the definition offered by State University of New York (SUNY) is comprehensive and relevant for those postsecondary institutions that are considering offering micro-credentials (2018):

- *Micro-credentials verify, validate and attest that specific skills and/or competencies have been achieved and are endorsed by the issuing institution, having been developed through established...governance processes and designed to be meaningful and high quality. Micro-credentials may represent credit or non-credit study; they may take the form of a digital badge or micro-award, and can be offered online, on-campus, or a hybrid of both.*

The SUNY definition emphasizes the importance of stackability and program alignment. It also provides extensive specificity regarding nomenclature, including types of micro-credentials like badges.¹⁷ SUNY's approach represents an exemplar model for those looking to develop micro-credentials with the dual intentions of both to advance labour mobility and access to post-secondary education through admission and transfer.

¹⁴ https://apolitical.co/en/solution_article/how-can-government-get-top-talent-canadas-free-agents-work-where-they-want

¹⁵ <https://www.ecampusontario.ca/wp-content/uploads/2019/10/2019-10-07-microcertifications-en3.pdf>

¹⁶ <https://www.ecampusontario.ca/micro-certifications/>

¹⁷ <https://system.suny.edu/media/suny/content-assets/documents/academic-affairs/Micro-Credentialing-TaskForce--Report.pdf>

TABLE 1: Defining Characteristics of Micro-credentials

Credential is	Details	Source
Digitized	Delivered in a digital format	RMIT University, 2020; Blazevic, 2020; National Education Association, 2002-2019; Willis et al., 2016; Horton, 2017
Both digital and non-digital		Pichette & Rizk, 2020
Officially verified, validated, or endorsed by the issuer	Credential is official verifiable by the trusted source	RMIT University, 2020; State University of New York (SUNY), 2019
Recognized externally	Officially recognized in an industry	Blazevic, 2020
Formal certification of what a person knows and can do through assessment of demonstrable evidence	Competency focused; activity based	RMIT University, 2020; Ryerse, 2017; Center for Teaching Quality, Digital Promise, 2016; Pichette & Rizk, 2020
Shareable, Portable	Learner can share the credential when and with whom they want	RMIT University, 2020; Ryerse, 2017; Center for Teaching Quality, Digital Promise, 2016
User controlled	The learner controls the content of the learning and the mode of delivery of the credential	RMIT University, 2020; Blazevic, 2020
Relevant to the workplace	Micro-credential reflects learning specific to workplace and currency; it is industry specific	RMIT University, 2020; Blazevic, 2020; National Education Association, 2002-2019; State University of New York (SUNY), 2019
On Demand	Learner can access the micro-credential learning experience when and where they want through an agile learning experience and/or assessment framework i.e., access and delivery are responsive to the learner's time requirements	Ryerse, 2017; Center for Teaching Quality, Digital Promise, 2016
Based on flexible learning and/or assessment	Not based on 'seat time' in a classroom; Does not involve counting credits or time in a course	Center for Teaching Quality, Digital Promise, 2016; State University of New York (SUNY), 2019
Lower Cost		Blazevic, 2020
Evidence rich		Willis et al., 2016
Stackable	Learning experiences that build upon each other towards further certification at a higher level of demonstrable competency	Willis et al., 2016; State University of New York (SUNY), 2019
Searchable, archivable		Horton, 2017
Standalone		State University of New York (SUNY), 2019
A complement to existing degree or diploma programs		State University of New York (SUNY), 2019
Reflected on a post-secondary transcript once earned		RMIT University, 2020

TABLE 2: Type of Learning being Credentialed

Credential represents...	Structure	Source
Modular learning experiences or assessments	Subject matter is broken down into specific components	RMIT University, 2020; Blazevic, 2020; Educause, 2020
Learning where delivery and/or assessment is personalized	Users select learning experiences based on their own needs	Ryerse, 2017; Center for Teaching Quality, Digital Promise, 2016
Learning achievement in a specific area, skill, or competency	Not broadly focused but specifically focused on a granular or more narrow skill or competency or components for a specific subject matter	RMIT University, 2020; Ryerse, 2017; Center for Teaching Quality, Digital Promise, 2016; Blazevic, 2020; Educause, 2020; National Education Association, 2002-2019; Willis et al., 2016; Horton, 2017; State University of New York (SUNY), 2019
Learning that is officially assessed or validated		National Education Association, 2002-2019; Pichette & Rizk, 2020; Horton, 2017; State University of New York (SUNY), 2019
Learning experiences that are short in duration	Short in length	RMIT University, 2020; Blazevic, 2020
Learning that results from either or both formal and informal settings		National Education Association, 2002-2019; Horton, 2017; State University of New York (SUNY), 2019
Learning that has been established through formal governance processes		State University of New York (SUNY), 2019
Flexible learning delivery	Examples: learning delivery online, on campus, off campus, hybrid - any time, anywhere, in any format	State University of New York (SUNY), 2019

Micro-Credentials and Digitization

A micro-credential can come in the form of an actual paper parchment, as a static secure PDF (Portable Document Format) or some variation,¹⁸ on a web page that presents the information coherently and perhaps in a manner that replicates a credential, or in a digitized format (in a manner that it looks like the paper parchment or like a digitized badge). For web or digitized versions, access is typically provided to underlying data about the learner or the program in which they studied. This information enhances understanding of what was studied and assessed, when this occurred, and so forth.

Examples of delivery modes for micro-credentials currently in use in the Canadian post-secondary sector vary. They typically include paper formats distributed in person or via mail to the learner, via email or through a website, through open source badging frameworks, and through online credential distribution platforms. Alternative delivery frameworks such as those that use blockchain are attracting interest to designers of micro-credentials (Schmidt, 2017).

The *digitized* form of micro-credentials was mentioned as a unique and defining feature both in interviews and in previous research; however, the advances in technology and greater adoption of digitized credentials indicates this is no longer a defining feature.¹⁹ The same is true of blockchain, which is widely used in various parts of the world including Canada, for distributing regular digitized diplomas and documents. Organizations around the world have been digitizing, sharing, and exchanging all manner of higher education documents and credentials using various formats for well over a decade. Entities such as the Groningen Declaration Network (GDN),²⁰ the IMS Global Learning Consortium (IMS Global),²¹ the Postsecondary Electronic Standards Council (PESC),²² and others support this work by creating or convening opportunities and/or developing best practice and data exchange standards. Previous research by the Association of Registrars of the Universities and Colleges of Canada (ARUCC) found several organizations around the world that are providing options for post-secondary data exchange at the national and cross-national level to facilitate data sharing across a host of platforms and vendors (Figure 4).

¹⁸ <https://helpx.adobe.com/acrobat/using/pdf-x-pdf-a-pdf.html>

¹⁹ <http://www.lehman.edu/provost/documents/exploring-micro-credentials-and-badges.pdf>

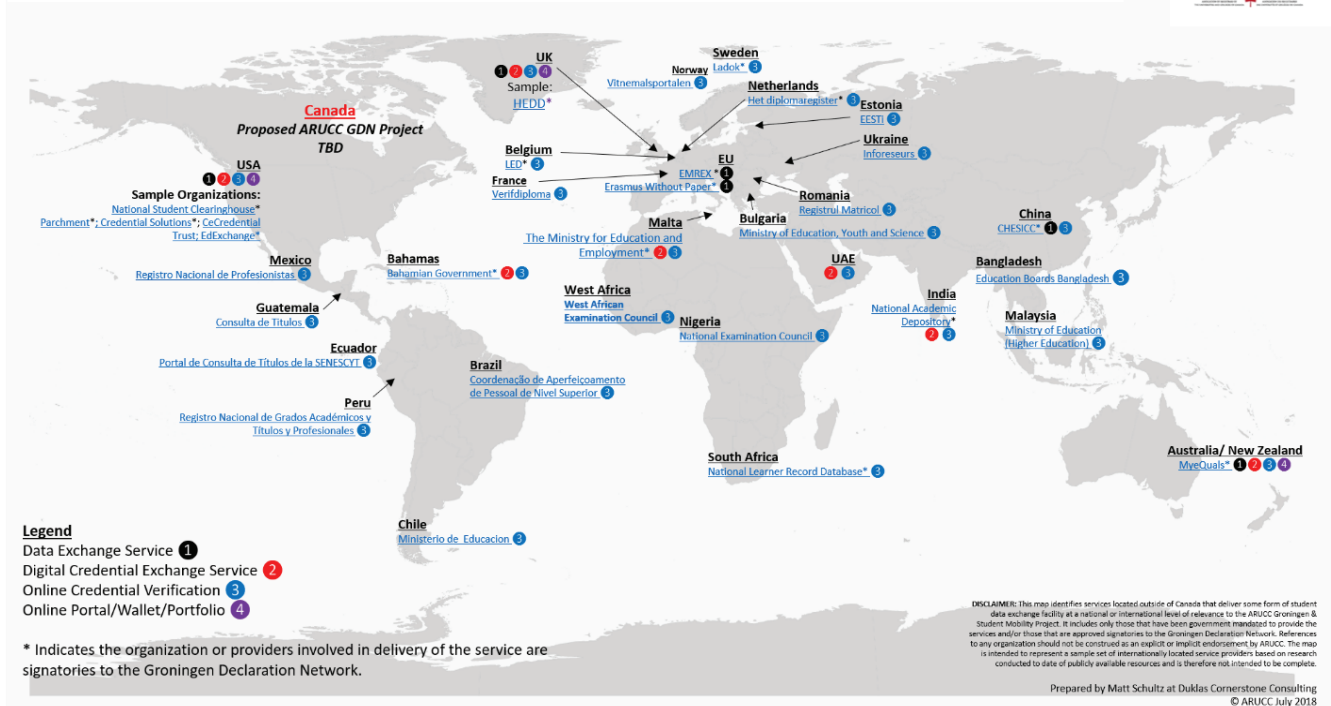
²⁰ <https://www.groningendeclaration.org/>

²¹ <http://www.imsglobal.org/>

²² <https://www.pesc.org/>

FIGURE 4: A Sample of National Level Credential Exchange and Validation Service Providers in Higher Education

A Sample of National Level Student Data Exchange & Validation Services



Source: Duklas Cornerstone Consulting Inc., 2019. Reprinted with permission from ARUCC.

Exploring the Quality of Micro-Credentials

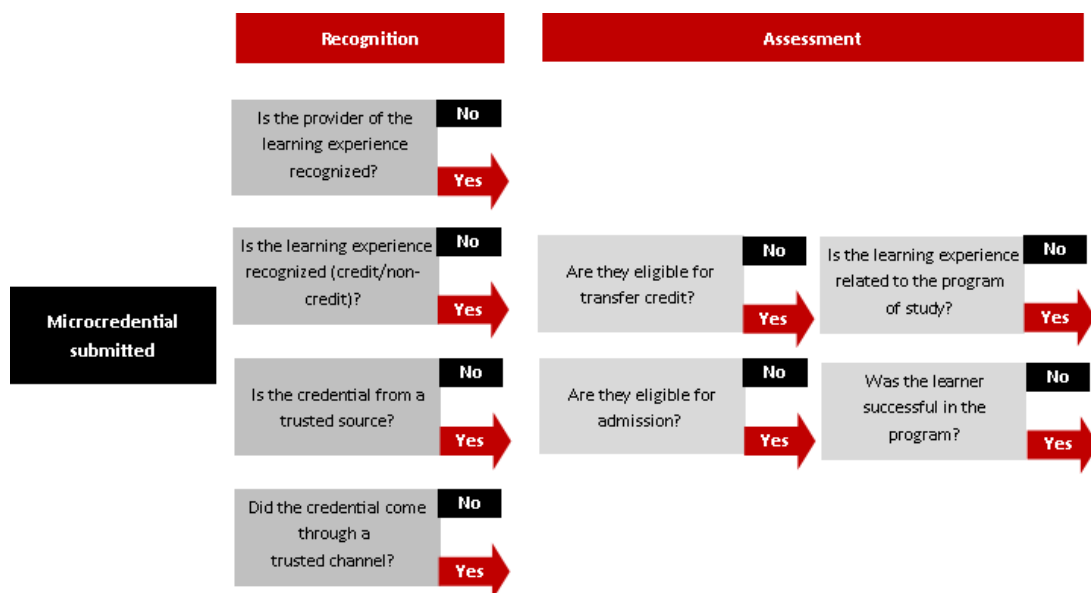
Admission and transfer assessment experts and their academic leaders are concerned about trust and the quality of micro-credentials. Who is validating the micro-credential? Is it from a recognized organization? Is the credential official? What learning is being credentialed? What was the nature of the assessment? What are the quality controls in place? (Educause, 2014).

Organizations and institutions are developing standards, frameworks, and best practices to address quality, establish stronger alignment, and reduce micro-credentialing confusion (Diaz et al., 2015; eCampusOntario, 2019). Much of the effort thematically involves developing standards related to nomenclature and frameworks for micro-credentials that situate them within a locally relevant context. Focusing specifically on admission and transfer into post-secondary institutions, the development of standards is helpful as a beginning state. For each province and territory, further study and discussion are needed both within institutions and within quality assurance bodies at multiple levels to determine where micro-credentials sit within overall credentialing frameworks and quality assurance contexts. This opportunity for further discussion and research is not unique to Canadian post-secondary institutions.

Concerns around the quality of micro-credentials appear to be growing in an area directly relevant to admission and transfer assessment. Specifically, are these micro-credentials verifiable, trusted, resulting from quality assured programs, and aligned with existing qualifications frameworks? In this context, some researchers have explored the ethical dimensions of learners creating their own programs by weaving together micro-credentials focused on specific skills and or competencies. The implication, they argue, is a change in the power paradigm within the postsecondary context (Willis et al., 2016). For example, Willis et al. (2016) suggested that with the introduction of learner controlled and directed micro-credentials, control of the learner experience no longer sits entirely with the accrediting bodies, quality assurance agencies, institutions, and/or faculty.

Admission evaluation and transfer assessment occur in a context shaped by post-secondary policies and quality assurance frameworks. If a micro-credential is to be considered as a bona fide credential during these assessment processes, expectations typically exist that the learning experiences (including those represented by micro-credentials) have been structured, delivered, and assessed by trusted entities in accordance with accepted and recognized quality assurance expectations and frameworks. Due to an increase in document fraud,²³ the assessment processes for both admission and transfer within post-secondary institutions in Canada and around the world (and for other organizations such as regulatory bodies and trades associations) seek to confirm and validate the provider of the learner experience, the provider of the credential (which is not always a recognized post-secondary institution), the distribution channel through which the credential arrived at their doorstep, and the learning experience (Figure 5). Once these are satisfactorily addressed in accordance with institutional policy, the next step is to establish admissibility and, if applicable, comparability and or equivalency for transfer.²⁴ However, if the response is *No* in any question in Figure 5, the assessment of a record may be stopped.

FIGURE 5: Example of Decision Milestones Impacting Micro-Credentials - Post-secondary Admission and Transfer



The current approaches for post-secondary admission and transfer are well supported by best practice standards and assessment guidance provided by institutional policies and external entities including accrediting bodies. This support implies that best practice expectations exist by those conducting admission and transfer assessment and their academic leadership. The overriding assumption is that the providers of the learning experience and the sources of these micro-credentials (including the source of the actual credential) are trusted and potentially even recognized (i.e., from a recognized institution or, if applicable, from a recognized industry or organizational partner).

The evidence from this research indicates that continuing education departments at post-secondary institutions are leading the way with micro-credentialing innovations in higher education. However, that does not mean that micro-credentials created from these innovative efforts will be accepted automatically for admission and transfer into recognized post-secondary certificates, diplomas, and degrees. The subsequent acceptance and assessment of these developed micro-credentials by regulatory bodies and trades

²³ Unfortunately, certification fraud is not industry specific; post-secondary institutions are not alone in this struggle. Major industry providers in IT also struggle with this issue (Musthaler, 2008).

²⁴ This research does not delve into the details of how assessment occurs, nor the concepts of comparability and equivalency and the various conventions and best practice considerations. For details on assessment practices in Canada, those interested in further research in this area are encouraged to review *International Transfer Credit Practices* (Duklas, 2019)

organizations across the country may not be a natural next step after a learner graduates. The credential quality construct exists for both post-secondary institutions and for regulatory bodies. This construct is a reality heavily governed by institutional policy and sometimes by various binding policy directives, statutes, regulations, and practices set externally by the government.

Designers of micro-credentials should address two core questions: (i) what is it that learners need to be able to know and do upon completing the learning experience? and, (ii) what evidence would suffice to demonstrate they've achieved this learning? (Ryser, 2017) Such reflective questions safeguard rigor, alignment to approved post-secondary programs, and the quality of micro-credentials, and are important in the context of admissions and transfer.

More research and policy discussions are needed to explore and address credential quality to aid adoption of micro-credentials as a support to admission and transfer, both within post-secondary institutions and government. The same is true for regulatory bodies and trades organizations.

Current and Emerging Exemplars of Micro-Credentials

Significant experimentation with micro-credentialing has occurred in the past two decades in higher education. These experiments continue as post-secondary institutions and governments consider opportunities to close the skills gap of learners and to advance labour mobility.

Several micro-credentialing examples and innovations with credential frameworks are relevant to admission and transfer. These innovations promote the credential quality discussion above as they represent examples where communities have developed approaches and capacities, including formal frameworks, to aid adoption and subsequent innovation and oversight of micro-credentials. Each example offers insight on ways institutions, higher education quality assurance bodies, and governments might separately or together develop various types of frameworks to aid creation of, support for, and adoption of micro-credentials.

Canadian Examples:

1. Thompson Rivers University, located in British Columbia, recently announced its status as the *first university in the world to recognize micro-credit transfer towards a university-level qualification* (Thompson Rivers University, 2020). Thompson Rivers University is a member of the Open Education Resource universitas (OERu), the new development represents an important access-based initiative where stackable learning experiences taken together support earning a terminal credential.
2. On a provincial scale, government-funded organization eCampusOntario recently created the *Micro-certifications Principles and Framework*, which is committed to recognizing both vertical and transversal skills of the learner and intended to guide pilot credentialing efforts within the province of Ontario (eCampusOntario, n.d.a.). Its *Framework*²⁵ emphasizes the following principles for micro-certification: relevance to the workplace, verifiability, ownership (i.e., by the learner), and extensibility (i.e., to support pathways to life-long learning). The *Framework* includes a commitment to ensure the learning is *transcriptable* (i.e., *compatible with existing transcripts where possible*). This is a key dimension to ensure recognition of learning for the purposes of admission and transfer. Implicit in this message is a nod towards the importance of considering embedding proxy indicators of quality when developing a micro-credential.
3. Algonquin College, located in Ontario, created an institutionally specific Framework to situate micro-credentials within their array of credential offerings (2020). The College leadership aligned micro-credentials with the *Ontario Qualifications Framework* by explaining the qualification descriptions and the standards including levels and learning outcomes achieved (Algonquin College, n.d.).²⁶ The authors of this Framework comprehensively outlined some of the provincial challenges and gaps for micro-credentialing in a context shaped by the institutional motivation to lead in delivery of personalized learning.

²⁵ <https://www.ecampusontario.ca/wp-content/uploads/2019/10/2019-10-07-microcertifications-en3.pdf>

²⁶ This report also contains information on other Canadian post-secondary institutions that have delivered digital badges to learners to augment existing curriculum.

4. Simon Fraser University (2020), British Columbia, recently launched *FASS Forward microcredit courses* in response to a Conference Board of Canada survey, which identified the need for additional support to help learners articulate the value of their degree to potential employers. Students enrolling in these courses take a one-month credit offering during the summer months to fulfill elective requirements. According to SFU, these courses are skills-based with opportunities to practice. Examples include a writing course, debating, social media, and personal financial planning.
5. Several institutions in Canada such as the University of British Columbia (UBC), Seneca College,²⁷ Ryerson University,²⁸ the University of Calgary,²⁹ Saint Lawrence College School of Business,³⁰ Humber College, and the George Brown College Office of Research and Innovation³¹ have adopted badges. While some badges are obtained through corporate training or sit outside the formal learning scene, other offerings provide capacity for instructors to create badges within their courses so that students achieve ongoing, just-in-time recognition for competencies/skills acquired throughout a course.³² Arguably, these could be artifacts of learning used to aid admission and assessment although ensuring a formal link to quality-assured learning experiences would be an important consideration.
 - The University of British Columbia (2019) has posted information to guide instructors on planning open badges for courses. The guide suggests considering key questions such as expected learning outcomes, skills/competencies/level of achievement that can reasonably be acknowledged through badging, and the competencies/skills recognized as having value in a field or discipline. It is unknown whether the badges in these various institutions might contribute to admission and transfer; however, the Thompson Rivers University example may open the door for using these credentials as potentially trusted indicators of achievement of learning outcomes beyond a transcript.
 - Humber College (Ontario) allows students to earn badges that can be stacked to form a certificate of completion in Social Media or certificate of participation in AVIT Architectural Design. When Humber College launched its micro-credentialing and badging initiative, one of the core values included ensuring the immediacy of the credential's availability to students and employers; something Humber College found not achievable with e-portfolios and co-curricular transcripts (Porter, 2019).
6. Saskatchewan Polytechnic offers micro-credentials, which they call LERN Microcredentials across a range of areas through their corporate training division.³³
7. Southern Alberta Institute of Technology (SAIT) and McMaster University have entered the online digital platform stage by allowing students to access their diplomas digitally (through mechanisms such as blockchain). In the case of McMaster, it launched a co-curricular micro-credential (non-credit) using blockchain as its first experiment with digitized credentials and now offers similar capabilities for earned diplomas.³⁴

Thompson Rivers University, located in British Columbia, recently announced its status as the first university in the world to recognize micro-credit transfer towards a university-level qualification (Thompson Rivers University, 2020). Thompson Rivers University is a member of the Open Education Resource universitas (OERu), the new development represents an important access-based initiative where stackable learning experiences taken together support earning a terminal credential.

²⁷ <https://www.senecacollege.ca/ce/technology/network-database-system/ibm-skills-academy.html#gsc.tab=0>

²⁸ <https://www.ryerson.ca/courses/instructors/tutorials/awards/awards-create/>

²⁹ <https://badges.ucalgary.ca/>

³⁰ <https://www.stlawrencecollege.ca/news/2014/badges/>

³¹ <http://gbcresearch.ca/about/online-innovation-badges/>

³² Through the eCampusOntario Open Badges community, post-secondary institutions are being supported with badging capabilities.

³³ <https://saskpolytech.ca/programs-and-courses/part-time-studies/micro-credentials.aspx>

³⁴ <https://www.eng.mcmaster.ca/news/mcmaster-becomes-first-canadian-university-offer-digital-degrees>

International Examples³⁵

1. Humber College, Otago Polytechnic in New Zealand, and Via University College in Denmark have established a global alliance to develop programming, research, and micro-credentialing opportunities (Humber College, 2019b). Otago Polytechnic innovated Edubits, which is a micro-credential primarily focused on the workplace.³⁶ Humber College holds the trademark for Edubits in Canada.³⁷
2. The *New Zealand Qualifications Authority* (NZQA) steered micro-credentialing pilots in 2018 to better understand how these credentials could fit within the country's training, education, and qualification system (n.d.a.). Currently, the NZQA has adopted an approval framework for micro-credentials, which embeds these into the existing qualification levels (n.d.b.). By taking this approach, the NZQA has ensured that approved, quality assured micro-credentials, once successfully achieved, are recorded on the learner's New Zealand Record of Achievement (NZRoA).³⁸ An approved micro-credential in this category must offer 5-40 credits, be closely tied to industry, be reviewed annually, and not duplicate quality assured learning approved by the NZQA. It can be aligned to qualifications frameworks in other jurisdictions, e.g., in Europe. The NZQA also maintains a publicly accessible registry of approved micro-credentials to aid assessment and manage quality assurance.³⁹ Many of these components would be necessary to aid adoption for use in post-secondary admission and transfer credit assessment in Canada. The approach taken in New Zealand appears similar to recommendations made in other research (Oliver, 2019).
3. The U.S.-based Lumina Foundation, a not-for-profit entity, and other organizations and institutions developed the *Common Credentialing Initiative* supported by the *Connecting Credentials Framework* (Lumina Foundation, 2015). The framework provides competencies as common reference points to clarify the levels and knowledge underlying different credentials, including micro-credentials. This initiative represents a scaled example of curating information about micro-credentials to minimize confusion over these credentials and enhance their specificity.
4. The Lumina Foundation and other organizations partnered to create the *Credential Engine*, which is now a not-for-profit organization that currently provides an online, searchable database of more than 730,000 different credentials to attempt to cut through confusion about the credential nomenclature, quality, and content.⁴⁰ It also contains the *Credential Transparency Description Language* (CTDL), which is intended to guide how credentials are described in the *Credential Engine*.⁴¹
5. SUNY Empire State College incorporates prior learning assessment practices including portfolio reviews in its admission and transfer credit assessments (Buban, 2017). The College supports the *National College Credit Recommendation Service* (NCCRS) and the *American Council of Education*, both of which validate learning achieved outside of institutions, a form of prior learning assessment (Buban, 2017). The College uses these assessments when determining admission and transfer credit. The College is also a member of the *Consortium for the Assessment of College Equivalencies* (CACE), which provides credit for learners credentialed outside of the traditional postsecondary context and is also part of the *Connecting Credentials Initiative* in the US described above. These organizations serve as proxies for developing trust and credential alignment.
6. The State University of New York developed an extensive and comprehensive overview of micro-credentials, including definitions and exemplars to guide its practices, for all its campuses.⁴²

³⁵ In 2017, Dr. Buban of the US-based Online Learning Consortium, conducted a case-based analysis of six institutions to examine how they incorporated assessment of alternative credentials in their prior learning admissions and transfer credit assessment practices (Buban, 2017). Her work and that of others informs these examples.

³⁶ <https://edubits.nz/about/>

³⁷ <https://edubits.ca>

³⁸ <https://www.nzqa.govt.nz/providers-partners/approval-accreditation-and-registration/micro-credentials/#heading2-8>

³⁹ <https://www.nzqa.govt.nz/nzqf/search/microcredentials.do>

⁴⁰ <https://credentialengine.org/>

⁴¹ <https://credentialengine.org/about/>

⁴² <https://system.suny.edu/media/suny/content-assets/documents/academic-affairs/Micro-Credentialing-TaskForce--Report.pdf>

7. The State University of New York at Stony Brook also offers stackable badges (for credit and for professional training) (State University of New York, 2018).⁴³ Stony Brook University's finance badges, which represent completion of two courses, can stand alone or be eligible for transfer credit into its finance or master's in business administration program (Buban, 2017).
8. IBM in partnership with several organizations in the United States and beyond have created the *Learner Credential Network* (LCN) which is focused on creating an *Interoperable Learner Record* (ILR). The ILR is a verifiable record of a person's achievements in education or training processes, formal or informal, classroom-based or workplace-based (Torres, 2020). While technically not a micro-credential, the ILR concept suggests the opportunity to embed micro-credentials in some way.

The NZQA has adopted an approval framework for micro-credentials, which embeds micro-credentials into the existing qualification levels. By taking this approach, the NZQA has ensured that approved, quality assured micro-credentials, once successfully achieved, are recorded on the learner's New Zealand Record of Achievement (NZRoA).⁴⁴ An approved micro-credential in this category must offer 5-40 credits, be closely tied to industry, be reviewed annually, and not duplicate quality assured learning approved by the NZQA. The micro credential can be aligned to credential qualification levels in other jurisdictions, e.g., in Europe. The NZQA also maintains a publicly accessible registry of approved micro-credentials to aid assessment and manage quality assurance.⁴⁵ Many of these components would be necessary to aid adoption for use in post-secondary admission and transfer credit assessment in Canada.

Portability and Technology

In their digital form, micro-credentials appear to have first emerged as digital badges through the work in the US with Mozilla's Open Badges in the early 2010s (IMS Global Learning Consortium, 2020). While these types of credentials still come in the form of skills-based badges, they also include other types that are distributed using blockchain technology and other formats supported by distribution and presentation technology platforms (Schmidt, 2017). Often, micro-credentials have been created using cloud-based, open source platforms, resulting in other terminology such as *web badges* (Putorti-Sandheinirich, 2013). The different terminology and approaches have created some confusion over the differences and similarities between micro-credentials.

The advances in enabling technology over the past decade present significant opportunities for moving all forms of digitized credential and document sharing and exchange forward. During the time of this research and report, the COVID 19 pandemic struck around the world creating a situation which amplified the increasing imperative to provide and recognize alternative delivery formats and models for document and credential sharing and exchange in higher education.

⁴³ <https://www.stonybrook.edu/spd/badges/index>

⁴⁴ <https://www.nzqa.govt.nz/providers-partners/approval-accreditation-and-registration/micro-credentials/#heading2-8>

⁴⁵ <https://www.nzqa.govt.nz/nzqf/search/microcredentials.do>

Canadian registrars and their counterparts in other countries foresaw the need several years ago for new models to deliver credentials and documents using enabling technology. ARUCC began research and consultation in 2015, and subsequently started creating a national solution for credential and document sharing and exchange (Duklas, 2019). Called the *ARUCC National Network*, the planned platform intends to launch in fall 2020.⁴⁶ It will not restrict capacities to traditional post-secondary documents and credentials but will provide a digital highway for learners to support post-secondary sharing and exchange of all forms, including badges and micro-credentials.⁴⁷ This network will introduce significant infrastructure modernization opportunities to enable digitization and electronic sharing on a large scale and in high volumes. It will allow learners to move their credentials where and when they want in a manner that preserves the quality of the Canadian higher education brand. EducationPlannerBC, the hub provider for BC post-secondary institutions, will be a pilot and collaborative partner for the ARUCC National Network.⁴⁸

As another example of recent pilots with institutions and industry partners, eCampusOntario (2020a) will be using blockchain to aid distribution of digitized credentials. eCampusOntario also created the *eCampusOntario Passport*, where badges are stored on a cloud-based platform, providing a centralized dashboard for organizations with the intention of contributing to a more consistent, structured badging system (eCampusOntario, 2020b).

Interoperability and the development of standards has also become critical as institutions need to efficiently connect technology systems that can support presenting credential outcomes of the learning experience (IMS Global Learning Consortium, 2016; Postsecondary Electronic Standards Council, 2020). According to Educause, the wide variation in badge requirements and a lack of standards for easy comparison may bring badge quality into question (2014), which is an important consideration for micro-credentials to aid post-secondary admission and transfer assessment. Such situations could be mitigated if micro-credentials intended to aid admission and transfer were offered through trusted sources such as recognized post-secondary institutions, credential depositories, and other entities (e.g., the planned ARUCC National Network).

As universally available transcripts, diplomas, and micro-credentials from post-secondary institutions become more accessible in verifiable, machine-readable formats through increased adoption of digitization and technology, greater access to and portability of credentials will hopefully be achieved.

The ARUCC National Network launched in fall 2020. It provides a digital highway and online credential portfolio for learners to support post-secondary sharing and exchange of all forms of official documents, including badges and micro-credentials. This Network will introduce significant infrastructure modernization opportunities to enable digitization and electronic sharing at scale and in high volumes and allow learners to move their credentials where and when they want in a manner that preserves the quality of the Canadian higher education brand. EducationPlannerBC, the hub provider for BC post-secondary institutions, will be a pilot and collaborative partner for the ARUCC National Network.

⁴⁶ <https://www.aruccnationalnetwork.ca/>

⁴⁷ <https://www.aruccnationalnetwork.ca/>

⁴⁸ <https://www.aruccnationalnetwork.ca/news>

Survey and Interview Findings

Survey Respondent Cohort

This study included administration of a national, bilingual survey to Canadian higher education institutions and other organizations and government bodies active in the micro-credential field. A total of 90 respondents partially completed the survey, of which 81 fully completed it for a 90% response rate.⁴⁹

Most of the 90 respondents came from BC (27%), Ontario (26%), and Alberta (10%) with a small percentage from outside of Canada (2%) (Figure 6).⁵⁰ The majority of respondents (81 respondents, 90% of the total) were affiliated with post-secondary institutions (Figure 7), and most represented registrarial areas within post-secondary institutions.⁵¹ The proportion of respondents from post-secondary institutions varied by province; for example, all BC respondents were from post-secondary institutions, while 83% of ON respondents were affiliated with post-secondary institutions. BC and ON, as the provinces with largest percentages of respondents were analyzed in greater detail.

Twenty-four responses were returned by administrative staff members (predominantly Registrar Office/ Admissions/ Enrollment Services staff) from 22 BC post-secondary institutions (18 public and four private institutions). There were 11 responses (46% of BC responses) from BC colleges, 1 response (4%) from a BC Institute, and also 12 (50% of BC responses) university responses. In Ontario, the responses were more varied: 39% of 23 ON responses were from university respondents, 35% were from college respondents, and 9% came from post-secondary institutes. The other 17% of responses were provided by respondents from government, a credential evaluation organization, a professional association or council and other affiliations.

⁴⁹ A total of 94 respondents accessed the survey; however, three did not provide any responses to the questions asked and one was a test response. These were deleted from the analysis leaving a total of 90 respondents to inform analysis.

⁵⁰ Although several BC institutions participated, only five offer micro-credentials. This limited the ability to conduct detail analysis of BC institutional micro-credentialing practices; the results should be treated with caution.

⁵¹ Only one faculty member participated. Most respondents were within central Registrar's Offices/Admission Officers. Those post-secondary respondents that identified Other departments referenced the following: Academic Development, Faculty of..., Learning Innovation, Open Education, President's Office, Teaching and Learning, and Continuing Education.

FIGURE 6: Geographical Diversity of Respondents by Percent (n=90)

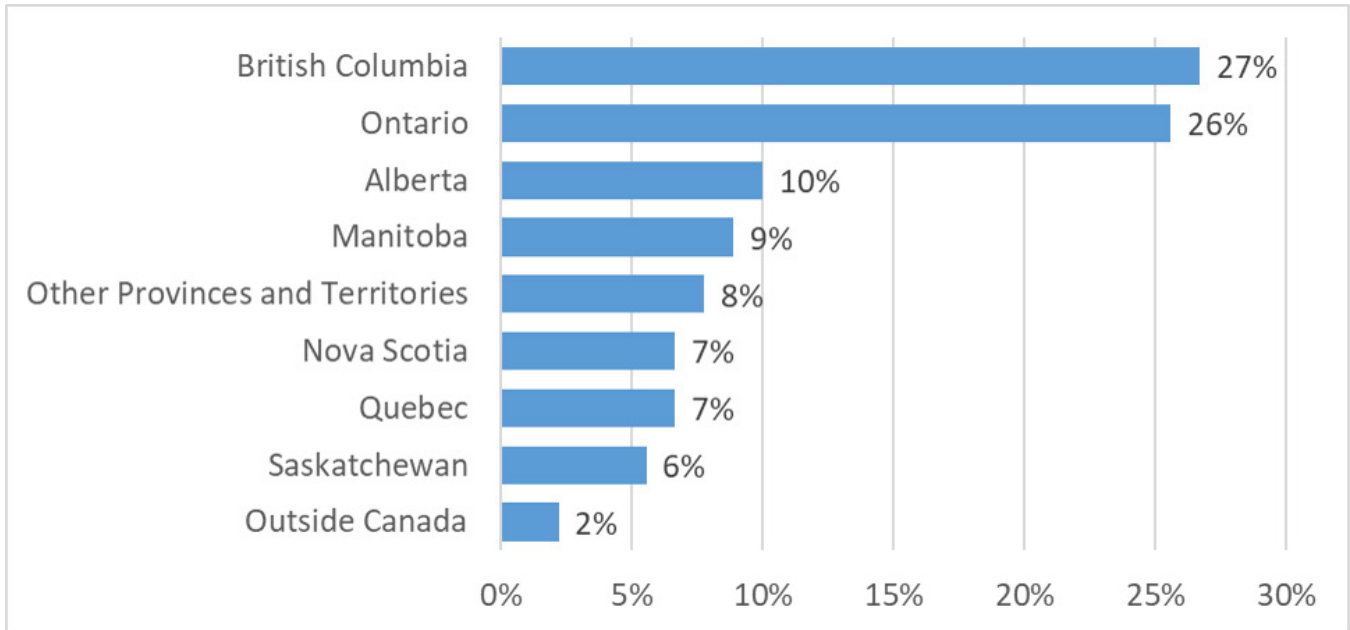
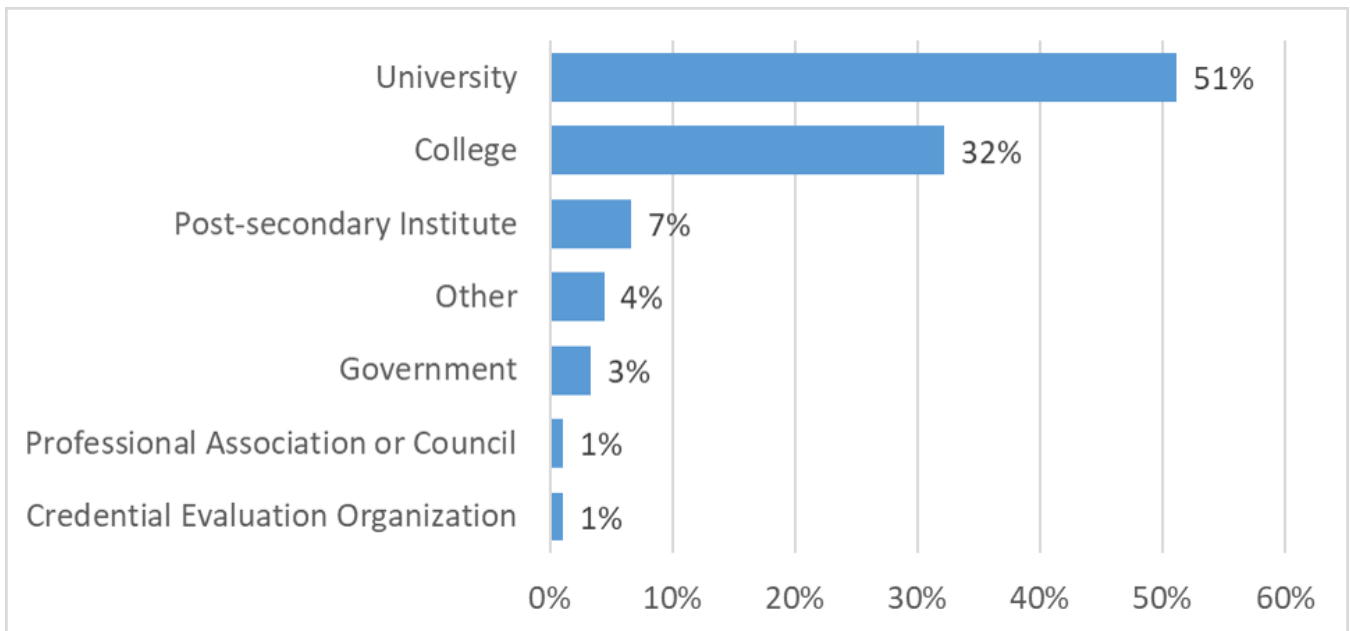


FIGURE 7: Types of Organizations Represented in the Survey by Percent (n=90)

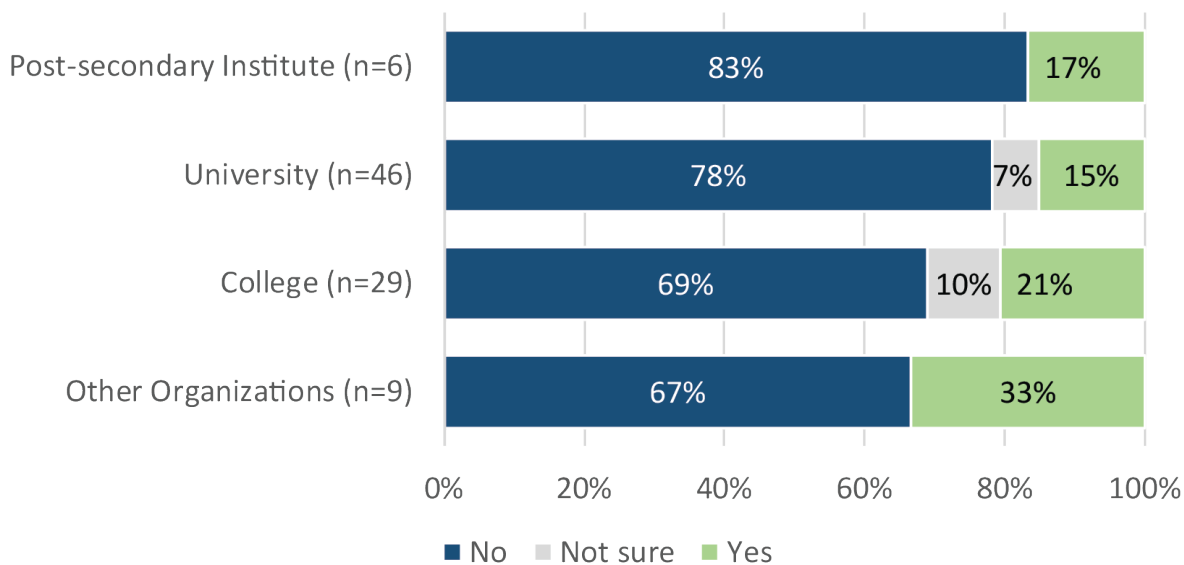


Micro-Credential Providers

About one in five (19%) of all 90 respondents reported having a working definition for micro-credentials, with colleges more commonly represented than universities and institutes: 21% of college respondents indicating having a definition, in contrast with 15% of the university respondents and 17% of institute respondents (Figure 8). Most respondents (88%) indicated "Not sure" or "No" when asked if their organization maintained a procedural framework for managing micro-credentials. Twelve percent (12%) out of 90 respondents indicated that their organization had a framework for managing micro-credentials.⁵²

Nineteen post-secondary institutions reported offering micro-credentials to students. Of these, respondents from the following British Columbia post-secondary institutions reported offering micro-credentials: Kwantlen Polytechnic University, Trinity Western University, Emily Carr University of Art + Design, Thompson Rivers University, and the University of the Fraser Valley. In Ontario, respondents from three post-secondary institutions reported offering micro-credentials. These were McMaster University, Humber College, and Confederation College.

FIGURE 8: Percentage of Respondents from Institutions with or without a Working Definition for Micro-Credentials by Organization Type (n=90)



Definitions and Nomenclature

Twelve respondents provided insights regarding the definitions in use at their organizations; most of these were post-secondary institutions. Sample comments included the following:

- "A micro-credential is certification of assessed learning that is additional, alternate, complementary to, or a component part of a formal qualification." (BC university)
- "Certificates are our micro-credentials, and they are formal and informal. Formal certificates are approved by Senate and are noted on the transcript. Informal certificates are not." (BC university)
- "A micro-credential is a certification confirming that the recipient has completed one or more courses that are focused on skill(s) or competency(-ies) attainment. Micro-credentials are short, concentrated programs that are flexible, innovative, timely and are based on industry needs. They are designed to be high quality, meaningful and are assessment-based credentials. Micro-credential programs are offered on campus, online and in hybrid formats and some micro-credentials may be stackable." (ON college)

⁵² Three of these said "No" or "Not sure" when asked the previous question enquiring about a definition. This discrepancy was not explained.

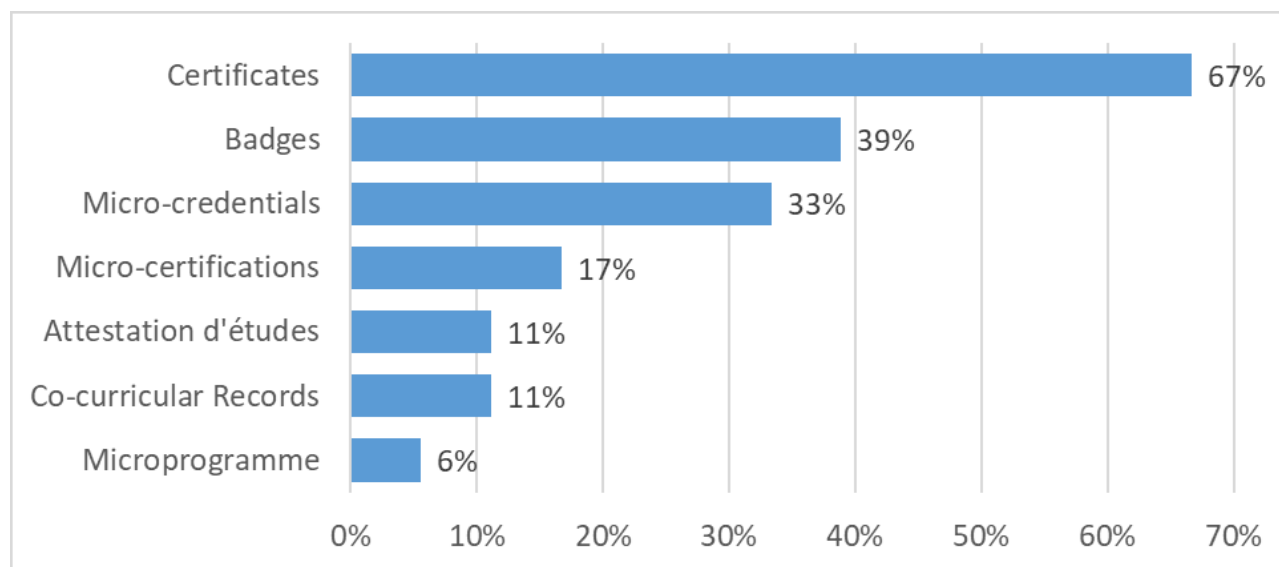
The following institutions provided publicly available examples: Bow Valley College,⁵³ Ontario Tech University,⁵⁴ University of Montreal,⁵⁵ HEC Montréal,⁵⁶ University of Calgary,⁵⁷ and MacEwan University.⁵⁸ Two organizations provided helpful supporting information: SRAM, a Quebec CEGEP application centre,⁵⁹ and a private vendor.⁶⁰

Due to variability in nomenclature and definitions, the survey sought to identify the terminology used and the defining characteristics of micro-credentials offered to students from the perspective of Canadian higher education respondents. One respondent per institution was allowed (the overall post-secondary institution count was 18, with six colleges/institutes and 12 universities), and the respondents were permitted to choose more than one response in both questions.⁶¹

The names reportedly in use at Canadian post-secondary institutions to describe micro-credentials varies extensively, with certificates (67%) and micro-credentials (33%) being the most common, followed by some variation of the word ‘badges’ (Figure 9). “Certificates” was the most common term that was used by both the BC and ON respondents when referring to micro-credentials awarded to students.

Differences appear to exist between colleges/institutes and universities; however, this data is presented with caution given the low ‘n’ counts of respondents by sector (Figure 10). The terms ‘micro-credentials’ and ‘badges’ were reported as being in use by both groups with more universities than colleges referring to micro-credentials as certificates (75% and 25% of all respondents respectively). Since badges are a subset of micro-credentials, an opportunity exists to establish a nomenclature framework to minimize potential confusion.

FIGURE 9: Terminology Used to Describe Micro-Credentials at Post-Secondary Institutions by Percentage (n=18)



⁵³ <https://bowvalleycollege.ca/teaching-and-research/pivot-ed/introducing-pivot-ed>

⁵⁴ <https://learninginnovation.ontariotechu.ca/microcredentials/index.php>

⁵⁵ <https://secretariatgeneral.umontreal.ca/documents-officiels/reglements-et-politiques/reglement-des-etudes-de-premier-cycle/#les-programmes>

⁵⁶ https://www.hec.ca/programmes/description-officielle/description_officielle_2019-2020_certificats_micro.pdf;

https://www.hec.ca/programmes/description-officielle/description_officielle_micro_2e_cycle.pdf

⁵⁷ <https://badges.ucalgary.ca>

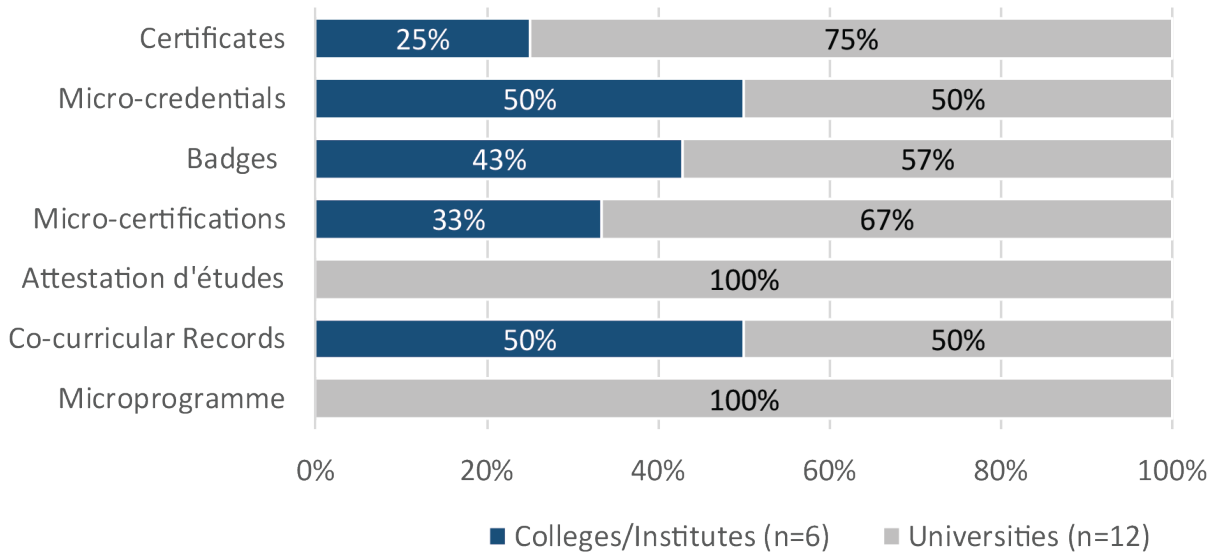
⁵⁸ <https://www.macewan.ca/contribute/groups/public/documents/policy/credentials.pdf>

⁵⁹ <https://www.sram.qc.ca/formation-continue-et-cours-du-soir/admission-aec-dec-et-cours-du-soir>

⁶⁰ <https://www.jet.org.za/news/digital-credentialing-implications-for-the-recognition-of-learning-across-borders>

⁶¹ The survey sought to identify nomenclature and defining characteristics across all micro-credentials offered as opposed to analysing practices and perspectives by credential.

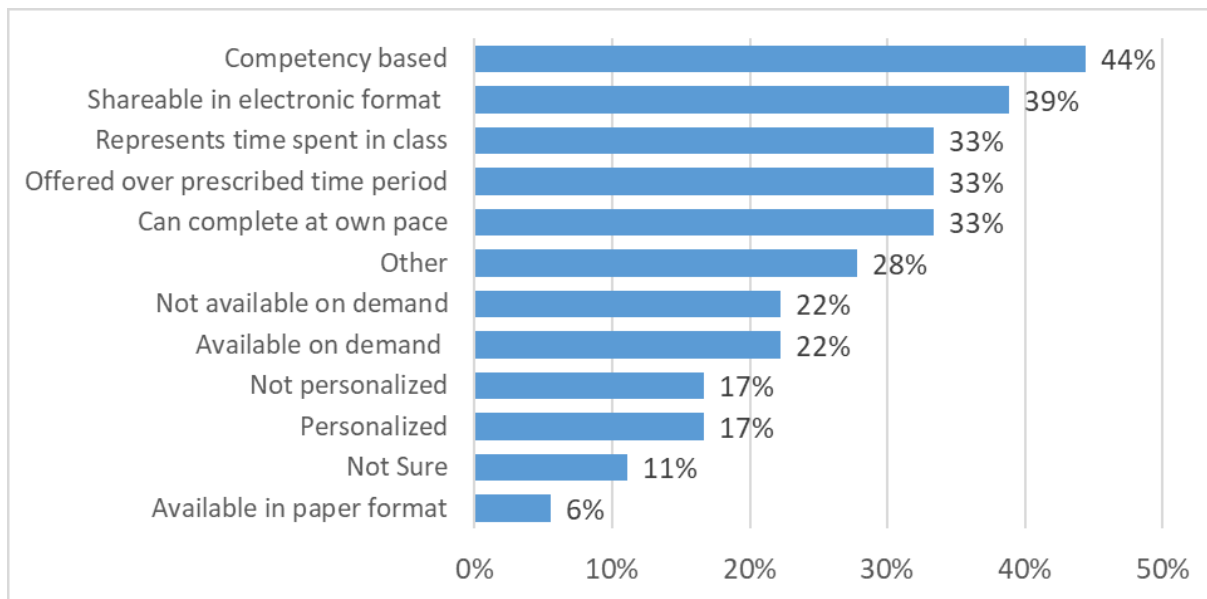
FIGURE 10: Micro-Credentialing Terminology in Use by Institutional Type and Percentage (n=18)



Defining Characteristics of Micro-Credentials

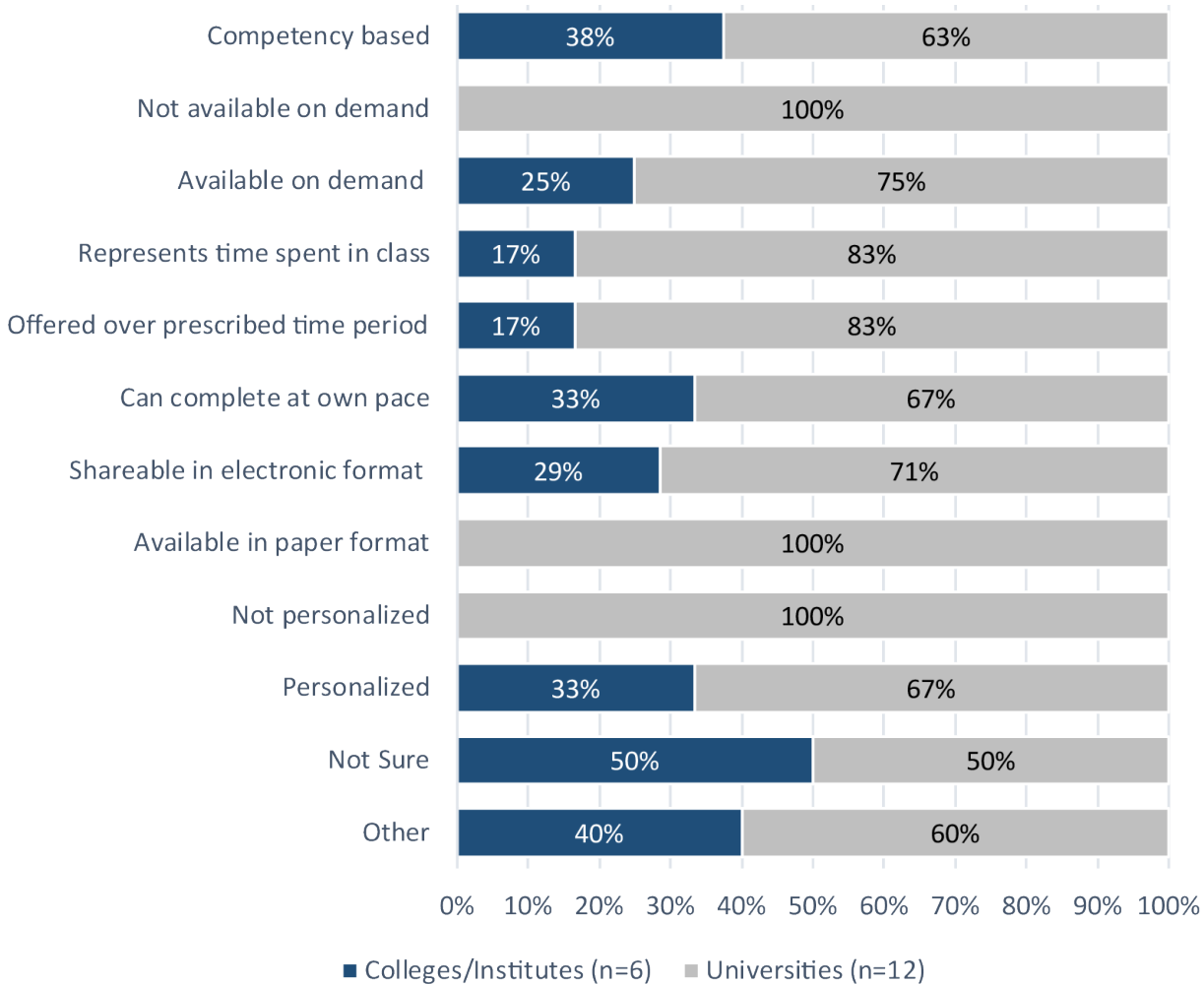
Of 18 post-secondary respondents from institutions that offered micro-credentials, most reported the competency-based focus (44%) and digitized format (39%) as the most common characteristics (Figure 11). While the 'n' counts were low, the data suggest that university micro-credentials appear to represent learning offered over a prescribed duration more so than colleges/institutes (83% of all university respondents vs. 17% of college respondents) (Figure 12). At the same time, 75% of university respondents reported that learning credentialed with micro-credentials were available on demand. This question might have resulted in clearer outcomes if individual micro-credentials were examined (respondents were allowed to choose more than one response).

FIGURE 11: Defining Characteristics of Micro-Credentials by Percentage of Responses (n=18)



Defining characteristics mentioned in the Other category included 'a group of courses that meet the graduation requirements and other courses that are taken in addition to the student's required degree requirements'; 'a Micro-credential verifies, validates, and attests that specific knowledge, skills, or competencies have been achieved'; 'a digital badge is a machine readable and shareable digital representation of a micro-credential that contains meta-data'; 'assessment based'; 'based on PLAR principles'; and 'workplace authenticity'. The elaboration illustrates the motivation to explain the defining characteristics of micro-credentials, specific to the respondents' post-secondary institution.

FIGURE 12: Defining Characteristics of Micro-Credentials by Institution Type and Percent (n=18)⁶²



Most post-secondary institutions (67%) refer to micro-credentials as 'Certificates' with two primary defining characteristics: competency based (44%) and shareable electronically (39%). Other customizable characteristics such as offering these credentials as non-time dependent, on demand, and outside the classroom were mentioned less frequently as defining characteristics for micro-credentials.

⁶² Note: The respondents could choose more than one response.

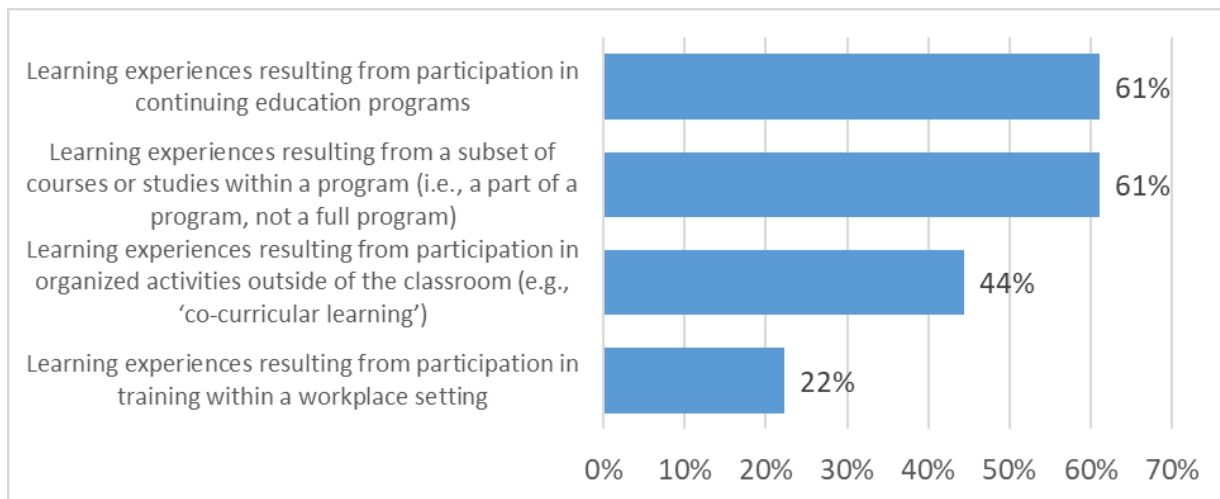
Learning Experience Being Credentialed

Examining the type of learning experiences currently reflected in micro-credentials at higher education institutions helps to illuminate their intended purpose. Most respondents (61% of all 18 PSI respondents) indicated that the micro-credentials offered at their institution represented learning occurring as part of a program, or through continuing education (Figure 13).⁶³ These were also the most common responses from BC and ON respondents. The next most common learning experiences were those resulting from co-curricular education (44%). Workplace learning represented the lowest response category (22%). Three other responses included additional suggestions such as acquisition of a specific subset of knowledge, skills, and attitudes of a "globally minded citizen", maker space, mentorship, self-directed learning (with no other details provided), and stand-alone micro-credentials that are not part of a subset of a program.

These micro-credentials are important for admission and transfer assessment. Since they are competency-based, using micro-credentials might also serve to augment assessment gaps and turn the focus to learning outcomes rather than credit counting. These credentials might also help to close some of the gaps found in learning assessment when course outlines are not available, a perennial challenge in practice at post-secondary institutions (Duklas, 2019).

Exploring and defining the purpose of micro-credentials as it relates to what learning is being credentialed appears to be an important consideration during the development of such offerings. Specifically, developers would be well-served by answering the questions, *What learning experiences are these micro-credentials representing? Could they and should they be credit bearing or count formally in some way towards formal learning experiences? Can intentions for future admission and transfer be considered in the original design of a micro-credential?*

FIGURE 13: Learning Experiences Credentialed in a Micro-Credential (n=18)



⁶³ Respondents were permitted to identify more than one option. As this question sought to identify current practice and was not opinion based, one college respondent's response was removed (the overall post-secondary institution count was 18, with six colleges/institutes and 12 universities).

Motivations for Developing Micro-Credentials

The respondents from 19 post-secondary providers of micro-credentials included insights about the motivations for awarding micro-credentials to students, the learning recorded, and their institutional practices.⁶⁴ Post-secondary institutional motivations vary (Figure 14).⁶⁵ The most common motivation was to *'Provide access to further education'* (74% of post-secondary respondents). All Ontario respondents from institutions that award micro-credentials to students mentioned this motivation. The next significant motivators behind providing access to further education included the following:

- *Addressing a specific workplace need* – 68% of respondents
- *Recognizing learning achieved* – 63% of respondents.

These were the most frequently mentioned motivations by BC respondents – four out of five BC respondents mentioned these two motivations.

Supporting *'Future admission and transfer assessment'* was mentioned less frequently (21% of respondents). *'Scaffolding learning opportunities'* ranked higher as a motivation (42% of respondents). Since accessing further education requires that a student be assessed for admission and possibly transfer credit, it suggests a disconnect and an opportunity to align motivations when designing micro-credentials.

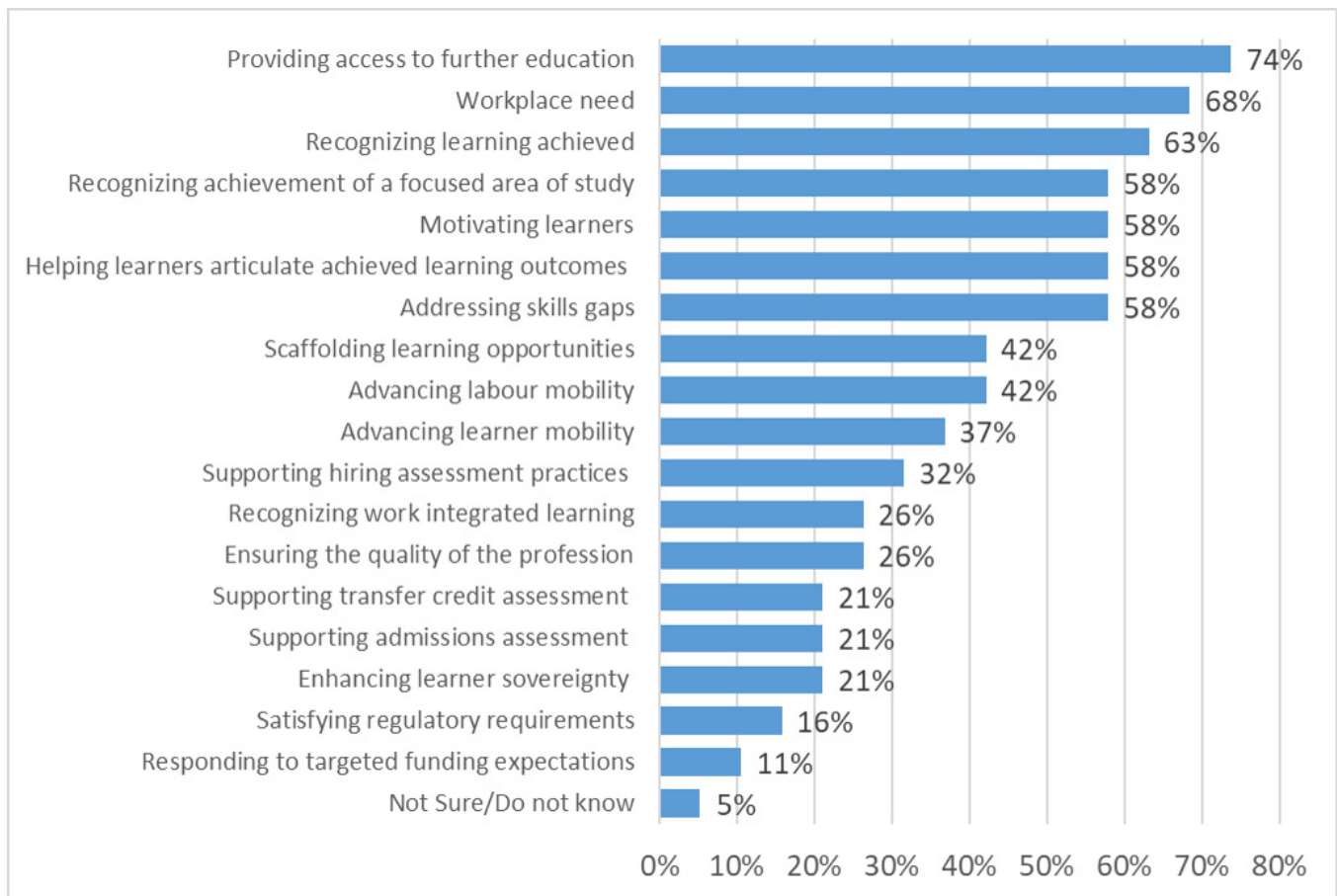
Each response option, (*'Addressing a skills gap'*, *'Helping learners articulate learning outcomes achieved'*, *'Motivating learners'*, and *'Recognizing achievement of a focused area of study'*) tied for 4th place at 58% for all post-secondary respondents. *Satisfying regulatory requirements*, another potential missed opportunity for micro-credentials, did not emerge as a significant motivator (16% of respondents).

The findings suggest that for post-secondary institutions, opportunity exists to more closely align intentions for these micro-credentials with opportunities for improving transfer credit and admission assessment. Embedding a focus on transfer into the design and approval framework of these micro-credentials would be very helpful to learners as a means to advance access to higher education.

⁶⁴ One institution included responses from two individuals making the 'n' count 19. Both were included in this analysis as this was an opinion question.

⁶⁵ More than one response per institution was allowed and respondents could choose more than one motivation. Respondents were offered an opportunity to provide additional reasons in a subsequent question supported by a freeform field. Two college/institute respondents indicated that motivations included enhancing flexibility for students or did not provide a reason. Three university respondents indicated motivations included enhancing post-secondary efficiencies, essential skills development, opportunities to enter or maintain status in a profession, and revenue generation for a School of Continuing Education.

FIGURE 14: Motivations for Offering Micro-Credentials (n=19)



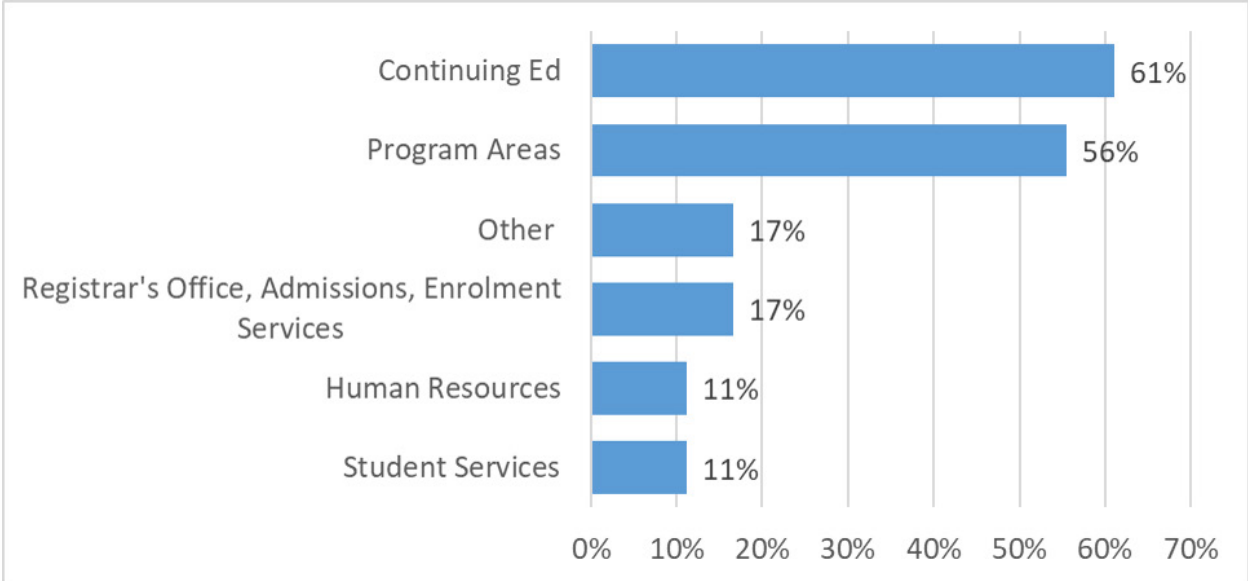
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Micro-Credentialing Source

The post-secondary respondents reported multiple sources for micro-credentials including directly from programs, continuing education departments, student service areas, central academic areas, and others, unlike official academic credentials, which are distributed by the Registrar’s Office. Only 17% of the post-secondary respondents indicated micro-credentials were distributed through central registrarial areas (Figure 15). Most are distributed through Continuing Education Departments or programs/ Faculties. This finding was the same for both BC and ON respondents: four out of five BC respondents and two out of three Ontario respondents mentioned faculties / program areas, and the next most frequent response for both provinces referred to continuing education departments.

Given the need for tight quality assurance, connectivity to academic mission and program approval, and consistent governance for micro-credentials, the Registrar’s Office would be the most appropriate department to certify and distribute institutional level micro-credentials and potentially program level micro-credentials. Determining the purpose of the credential, defining what *official* means, and identifying the quality assurance context for a micro-credential are important considerations when designing these credentials.

FIGURE 15: Departments within a Post-Secondary Institution that Oversee Awarding Micro-Credentials (n=18)



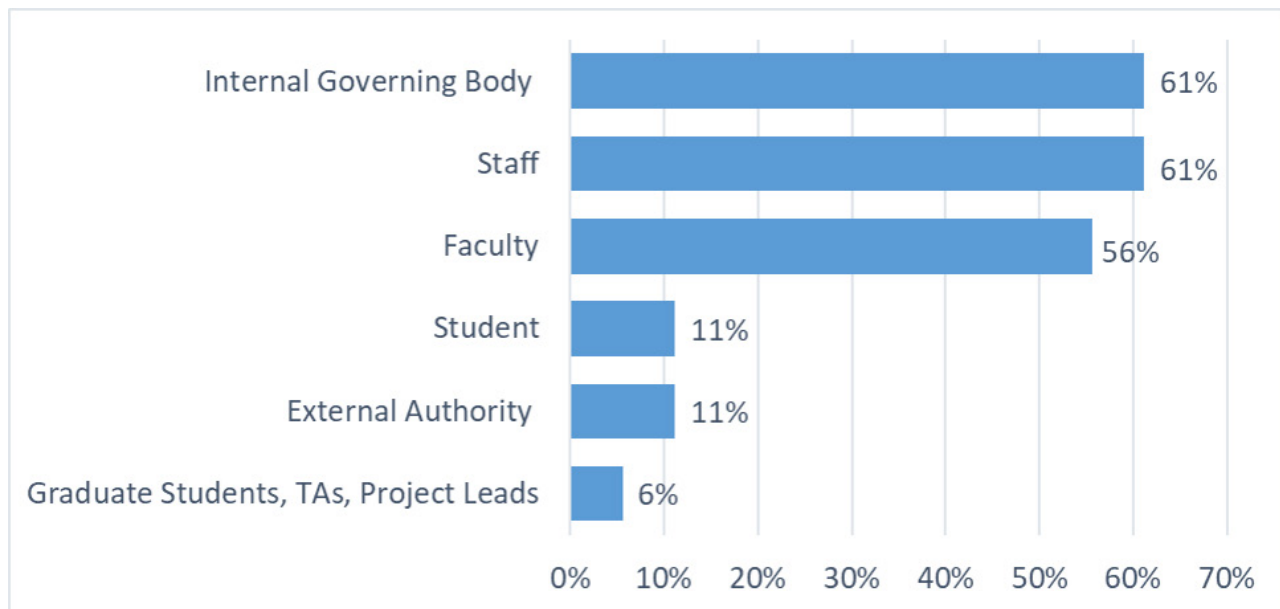
Approval Authority for Micro-Credentials

Staff (61% of all post-secondary respondents), faculty (56%), and internal governing bodies like Senate or Council (61%) approve most of the micro-credentials at the institutions represented by the survey respondents.⁶⁶ Academic leadership appears to be accountable primarily for these micro-credentials through faculty or international governing bodies (Figure 16). Eleven percent of respondents reported that students themselves were overseeing these credentials.

For BC, an internal governing body (e.g., Council or Senate, program area, central department) was identified by four out of five BC respondents and by two of three ON respondents, as providing the quality oversight for the micro-credentials awarded to students. All three Ontario respondents also identified staff members as the point of quality oversight; while only two of five BC respondents mentioned staff.

⁶⁶ One institutional respondent was removed from the data set for this question to avoid duplicate counts for the same institution; the remaining total of the respondents was 12.

FIGURE 16: Internal Approval Authority for Micro-Credentials, Percentage of Respondents (n=18)⁶⁷



Considering Micro-Credentials for Admission or Transfer

The survey explored whether any of the post-secondary institutions that offered micro-credentials considered them for admission or transfer. Over one third of respondents (39% of 18 respondents) did not consider micro-credentials for admission, while 17% of the respondents did consider them for admission. 'Possibly' was the most common response (44% of respondents) for considering micro-credentials for admission. One third (33%) of the respondents considered micro-credentials for transfer.

Fifty percent of respondents indicated course specific transfer was awarded, 11% indicated assigned credit was granted, and 6% indicated no credit was granted. Twenty-eight percent awarded one course; 22% of respondents indicated the amount of credit awarded varied. One of these respondents indicated that a minimum of 10 credit hours and a maximum of 30 credit hours could be granted, which seems very similar to the New Zealand Qualifications Authority's approach (NZQA, n.d.b).

Transcription Practices

Thirty-nine percent of 18 post-secondary respondents reported transcribing their micro-credentials. Six institutions provided insights on institutional transcription practices. The responses included plans to recognize competencies and map these by program and by credit; noting the micro-credential as a regular course or as a transfer course; awarding Certificates of Achievement; and notating the results on a continuing education transcript. One respondent noted plans to list the name of the certificate in the program fields available at the top of the transcript, with the date awarded. Only one BC respondent reported "sometimes" transcribing micro-credentials; another respondent from Ontario confirmed their institution did transcribe micro-credentials.

⁶⁷ Note: more than one response choice was allowed.

When asked if they thought the micro-credential might be considered for admission and/or transfer at other post-secondary institutions, 33% of respondents indicated 'Possibly', with 33% responding 'No' and 28% responding 'Not sure'. Respondents from BC and ON institutions responded similarly. One respondent from a BC institution commented:

We have been piloting the use of micro-credentials for a few years in specific areas. As this work moves beyond its pilot phase, a policy and procedure will be developed and implemented. I expect this will significantly widen the scope of activity related to micro-credentials.

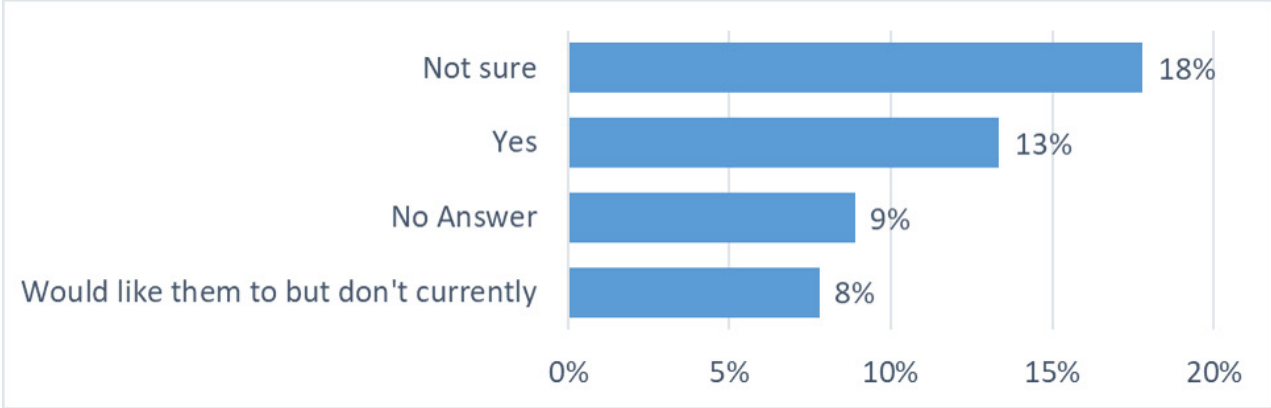
One institution provided a sample transcript which illustrated the micro-credential as a reference at the top of the document, the semester to which it was assigned, and the date. Another institution provided a credentials framework for situating micro-credentials, which identifies the name of the award, curriculum type (i.e., courses, workshop), number of courses, whether credit is granted, minimum number of hours, whether its graded, minimum grade point average required, and an example (i.e., of the courses). Although requested, no other samples were provided during this research.

Exploring the Human Resources Specialists' Perspectives

One of the project's objectives included exploring employers' perspectives on micro-credentials in the labour market. As post-secondary institutions are large employers, it seemed logical to extend the survey to that line of questioning to explore whether any examples existed of institutions using their own skills-based micro-credentials provided in their workplace for admission and transfer. Unfortunately, the number of responses were too small to support this level of analysis. Anecdotal findings emerged. Of the 90 respondents, three (3%) indicated they required micro-credentials to be submitted to support their human resource intake process. The stated purpose for doing so was to facilitate fulfillment of requirements for a regulated profession and to ensure completion of specific skills and competencies.

More than half of the respondents (52%) indicated they did not award micro-credentials to their employees (Figure 17). Thirteen percent of respondents reported providing these qualifications; of them, three responses were from BC (12% of all BC responses) and two from Ontario (9% of all Ontario responses). Examples of micro-credential recipients included company employees and external learners; individuals currently in non-credit programs who plan to take credit programs in the future; Health and Social Services industry partners; and Indigenous learners. Twenty-two percent reported employers had been requesting micro-credentials, suggesting some pent-up demand.

FIGURE 17: Micro-credentialing Awarded to Employees by Organizations, Percentage of Respondents (n=90)



Examples of employers included the following:

- Licensing bodies
- Automotive/transportation
- Information technology
- Financial services
- Business and industry/corporate partners/program committees
- Certification bodies
- Professional associations
- Government
- Health and Social Services; Long Term Care facilities
- Indigenous Partners in Northern Canada
- Aviation Sector
- Partnering universities abroad
- Retail
- Manufacturing
- Construction
- Large energy firms
- Publishing industry

One respondent provided the following details on the demand among employers:

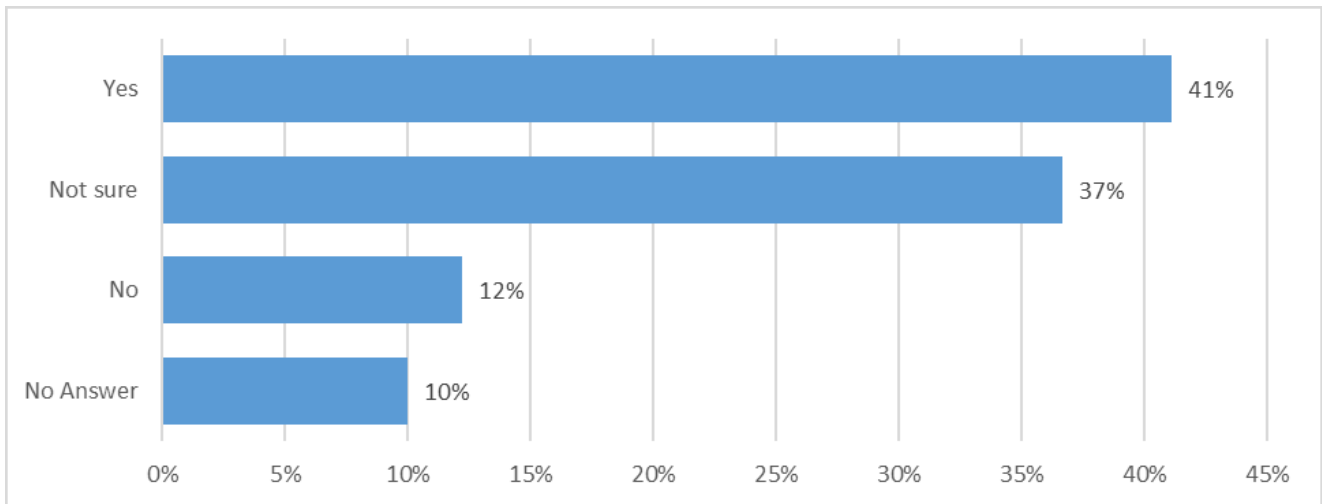
Fire departments want micro credentials based on skill acquisitions. Police detachments want micro credentials to verify that police have taken advanced training. Licensing boards have asked for some form of verification of completion of a course to verify a student has been successful in an applied course.

Only 6% of 90 respondents indicated they had evidence these credentials contributed to employment. Among BC respondents, only one respondent identified requests from employers: "I have evidence that verification of training is necessary for promotion within the professions where we train... I don't have any evidence that they have contributed to hiring." A single Ontario respondent mentioned reports from industry partner on recruitment as evidence of employers' demand. Most of the evidence appears anecdotal or tied to specific hiring success at graduation. Although the workforce evidence was limited, 41% of respondents reported plans to explore establishing micro-credentials (Figure 18). This included a larger percentage of ON respondents (65% of all ON respondents mentioned plans to incorporate micro-credentials into policies and practices) than, for example, BC respondents – only 25% of BC respondents reported having those plans.

For BC, five respondents shared next steps how their institutions intend to incorporate micro-credentialing into its policies and practices:

- "Develop a policy and procedure to support the use of micro-credentials for employees and students in both credit and non-credit areas";
- "Review the concept and context of micro-credentials to determine how we might use these in the future";
- "Continue the discussion about micro credentialing, and implement where possible";
- "Develop a definition of micro credential, have a policy that guides the development of these and then a process for automating them out of our student information system"; and
- "Integrate them into our offerings."

FIGURE 18: Plans to Adopt Micro-Credentials, Percentage of Respondents (n=90)



Overarching Considerations

All 90 respondents were asked to provide additional thoughts regarding micro-credentials. Suggestions included creating a framework to guide the development of micro-credentials and identifying stackability options to build or customize the learning experience. One respondent commented that micro-credentials represent an opportunity for recognition of prior learning and suggested a cross-jurisdictional approach to ensure consistency within and outside of Canada. This suggestion seems to align with what the New Zealand Qualifications Authority is pursuing by embedding micro-credentials into their qualifications framework.

Not surprisingly, the dizzying array of definitions proved confusing, which hampered some respondents. It appears that adopting shared definitions would be helpful. One respondent provided the following sentiment:

It is interesting to observe the momentum behind micro-credentials. To the extent that the very term "micro-credentials" has gotten so much currency to take on an increasingly more comprehensive meaning. A "synecdoche" (a part to represent the whole) whereby initially the term credential was referring only to the certificate awarded at completion of a course, while now it is substitute/synonym for the whole course/program.

Another respondent indicated that micro-credentials represented an important correction of credential creep, without providing further details.

Suggestions for Additional Research

The current study revealed opportunities to grow the body of research in Canada on what constitutes a micro-credential and to consider their relation to other credentials within existing institutional, sectoral or system qualifications frameworks. The findings suggest that a considerable variety of laudable motivations, including responsiveness and innovation to address labour market need and learner demand, are driving the creation of these credentials within post-secondary institutions. The research also identifies that micro-credentials are sometimes developed and maintained through educational quality assurance processes different from those for other certificate, diploma and degree programs within institutions. To support the goals of responsiveness and innovation, while mitigating potential implications such as credential confusion, quality erosion, and non-transferability, aligning micro-credentials (or at least a subset focused on stackability toward other credential programs) with existing quality assurance and credential frameworks (if available) and official institutional transcription and credentialing practices might present opportunities for improving learner access to further studies.

Potential research questions to inform that next stage discussion include the following:

1. How closely are existing micro-credentials tied to established educational quality assurance procedures for program development, delivery, and review? Should they be, or in what circumstances should they be, and would this represent a distinguishing factor to aid their utility for admission, transfer, and stackability?
2. What might be the implications of expansion of existing credential frameworks to include micro-credentials? Is this necessary in order to advance adoption of micro-credentials for admission and transfer assessment processes?
3. Where is responsibility and stewardship of micro-credentials situated within higher education organizations, and what are the implications of different approaches for transcription, admission, transfer, and stackability of the credentials?

Moving Forward

Several dimensions emerged from the research that are of relevance to successful admission and transfer assessment of micro-credentials. These include the following:

- Establishing shared definitions that fit the purpose intended;
- Aligning micro-credentials with existing quality assurance processes and contexts;
- Creating a credential registry;
- Building partnerships with industry;
- Aligning micro-credentials with existing recognition of prior learning processes; and
- Creating or supporting communities of practices to encourage innovation.

Establishing Shared Definitions

As the findings demonstrate, significant confusion exists regarding definitions for micro-credentials (Appendix A). It seems that depending on the intended purpose of micro-credential, the definition fluctuates. Two definitions stand out when considering admission and transfer:

- *A micro-credential is a certification of assessed learning that is additional, alternate, complementary to or a formal component of a formal qualification.... This report proposes that: credit-bearing micro-credentials include assessment aligned to a formal qualification level. Achievement of the learning outcomes leads to an offer of admission to or credit towards at least one formal qualification, regardless of whether or not the offer is taken up by the learner. Credit-bearing micro-credentials mirror and contribute to the academic standards required in the target qualification(s). The duration and effort required by the learner are in keeping with amount of credit earned in the target qualification(s).* (Buban, 2017)
- *Micro-credentials:*
 - *verify, validate, and attest that specific skills and/or competencies have been achieved;*
 - *are endorsed by the issuing institution;*
 - *having been developed through established faculty governance processes; and*
 - *are designed to be meaningful and high quality.*

At the most basic level, micro-credentials verify, validate, and attest that specific skills and/or competencies have been achieved. 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. Micro-credentials can be offered online, on-campus, or via a hybrid of both.... nationally, terms are often used interchangeably. For example, badging, a type of micro-credential, is often used synonymously with the term micro-credential itself.... Micro-credentials may represent the content of credit or noncredit study; they may take the form of a digital badge, MOOC, or micro-award, ... Micro-credentials may be specifically recognized by certain industries, in which case they may have the advantage of providing validation and attestation of industry-specified and frequently highly sought-after competencies.

Micro-credentials can be used to highlight competencies earned as part of a credit-bearing program (motivating students to persist and distinguishing students among prospective employers); serve as an introduction or entry point to a degree program (stackable); be issued as a stand-alone credential and/or complement a degree program. (SUNY, 2019)

Aligning Micro-Credentials with Existing Quality Assurance Processes and Contexts

The New Zealand Qualifications Authority (NZQA, n.d.a) is notable for its approach, which involves embedding micro-credentials into the qualifications framework. The European⁶⁸ *MicroHe Consortium* funded by the European Commission and the Erasmus + Programme provide other examples of work in this area. Tying micro-credentials to a formal quality assurance construct is lauded by some, (Buban, 2017) and would be helpful for admission and transfer given the signal it provides with respect to evidence of quality assurance (Duklas, 2019b). Utilizing established quality assurance processes within institutions may provide an alternative path to promote confidence in these credentials, although these would likely be more localized in their impacts, building on the familiarity with local, or high-profile institutions.

Creating a Credential Registry

A broadly recognized and trusted registry may reinforce a variety of quality assurance processes, and credential definitions. The approved registry offered on the NZQA's website,⁶⁹ the European Beta version of a Credential Clearinghouse,⁷⁰ and the *Credential Engine*⁷¹ in the US represent interesting system approaches to cut through the nomenclature confusion and support quality assurance.

Establishing Industry Partnerships

Micro-credentials by their very nature represent a compelling option for learners from a labour mobility lens. They serve to tightly link learning in higher education with work integrated learning. Transfer is being awarded by some institutions for industry organized micro-credentials. IBM's partnership with Northeastern University where badges are being awarded towards master's level credentials represents an example (Leaser, 2017).

Aligning Micro-Credentials with Existing Recognition of Prior Learning Processes

Micro-credentials could be used to enable scalable assessment and recognition of prior learning as these efficiently lower the barriers to access, the costs for the learner, and the costs for the post-secondary institutions. Buban (2017) argues that these credentials are particularly valuable for mature learners and shares examples of national strategies in other countries that are actively pursuing this area. If appropriately curated, micro-credentials provide a symbol of a coherent learning experience using a consistent artifact; thereby, reducing the need to conduct detailed assessments of a learner's background.

In 2017, the University of Michigan hosted a convening opportunity to explore usage of micro-credentials in the admission assessment process (Fishman et al., 2018). This very practical workshop concluded that micro-credentials can facilitate student to institution matching processes (i.e., establishing fit), address scalability challenges with holistic admission processes that rely heavily on manual review, and provide an opportunity to balance out admission decision processes that lean heavily towards conformity (e.g., mitigating the heavy reliance on grade point averages).

⁶⁸ <https://microcredentials.eu/outputs/wp3/>

⁶⁹ <https://www.nzqa.govt.nz/providers-partners/approval-accreditation-and-registration/micro-credentials/register-of-nzqa-approved-micro-credentials/>

⁷⁰ <https://credentify.eu/>

⁷¹ <https://credentialengine.org/about/credential-registry-overview/>

Creating Communities of Practice

Organizations and institutions around the world are creating and convening opportunities to aid exploration of micro-credentials. eCampusOntario's micro-certification conference represents a recent example.⁷² In the US, seven institutions are collaborating in the micro-credentialing space to offer a range of learning experiences and courses from different institutions to enhance the access, assessment, and efficiency of terminal credential completion for learners (Fain, 2015). In some ways, it is very similar to the work that is occurring at Thompson Rivers University with its recently announced launch of micro-courses (2020).⁷³

Micro-certification Business Models in Higher Education provides a very helpful framework to assist institutions with their evolving micro-certification efforts (Present, 2020; pp. 9-11). The document includes a typology of options to aid institutions with implementation. In the same spirit, a suggested checklist is provided in the next section of this report to aid policy developers who seek to implement micro-credentials that serve admission and transfer into post-secondary institutions. The assumption here is that for a micro-credential to be adopted into credential assessment practice for post-secondary studies, it must provide transparent assurances regarding its quality and likely should be designed with future transfer in mind. As they say often in the micro-credentialing realm, purpose matters.

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⁷² <https://www.ecampusontario.ca/events/>

⁷³ <https://inside.tru.ca/releases/thompson-rivers-university-takes-lead-role-in-global-education-accessibility/>

Implementation Checklist

- Purpose:** What are the underlying motivations for creating the micro-credential?
- Content:** What learning experiences are being represented through the micro-credential? What learning outcomes are being represented? Does this duplicate existing quality assured programming within an institution?
- Quality assurance (design, learning outcomes represented, and level):** If a core motivation is to advance access to higher education, what quality assurance and design considerations are important to consider when creating the micro-credential? Should future admission and transfer be considered in the design process?
- Trust:** What are the existing qualifications or credentialing frameworks, if any, and do they already address micro-credentials in some way, perhaps implicitly? If not, should they? Given a potential motivation for wanting a subset of these micro-credentials to provide access to further studies, why would exploring quality assurance for these micro-credentials matter?
- Credential quality dimensions:** Which credential quality dimensions are relevant to ensure trust in a micro-credential that might be used by post-secondary institutions in the admission and transfer assessment process? What implications will the credential have for the institution's stature in the community?
- Governance implementation:** What type of approval processes are needed to approve the credential? Is it an institution wide or department/program level credential or externally sourced? Which area is accountable for overseeing the micro-credential? How might its quality be better preserved by engaging the registrar to aid implementation? Where does it situate within the institutionally specific credential framework, if at all? Who should sign it, if at all? Is that even applicable?
- Operational Implementation:** How might the answers to the above questions inform potential adjustments to admission and transfer assessment policies and practices, assuming any are needed? Is adjustment needed i.e., what is the existing admission and transfer policy and is it already serving learners effectively through other mechanisms? What is needed within and beyond post-secondary institutions to enhance adoption of and receptivity to these micro-credentials by program areas and institutions that are receiving learners who are presenting these credentials?
- Efficiency:** How might system level efficiencies help to bring clarity to nomenclature, credential levels, alignment, and credential confusion?
- Learner access:** What changes are needed to encourage receptivity to trusted micro-credentials by post-secondary institutions as a support for learner access to higher education either within or across institutions? What opportunities exist for recognizing formal, non-formal, and informal learning that is assessed as part of recognition of prior learning.

Final Concluding Remarks

The objective(s) of this project included the following:

1. Reviewing current and emerging practices in developing and accepting micro-credentials in admissions and transfer in British Columbia and elsewhere;
2. Assessing institutional perspectives on motivations, issues, and opportunities for developing and using micro-credentials for admissions and transfer at post-secondary institutions in BC, Canada and beyond;
3. Exploring employers'/ human resources staff perspectives on micro-credentials in the labour market, if any information is available; and
4. Identifying areas for future research and, if appropriate, the development of practices.

To realize these objectives, various methods were employed including a national, bilingual survey, interviews with higher education micro-credentialing experts, and an environment scan of the literature and web information for micro-credentials. Obtaining examples of transcripts proved to be a challenge given the novelty of micro-credentials in higher education.

Most admission and transfer credit assessment processes appear blind to whether a student or applicant presented a micro-credential. As the source and the quality assurance context for these micro-credentials tend to be ambiguous or not well-known, credential evaluators (including faculty) appear to disregard them when assessing admission and transfer credit for post-secondary consideration. However, the survey identified a few institutions, including some in British Columbia, that recognize these credentials for admission and credit transfer.

Definitional variety exists across the country and around the world, which is causing some confusion. Among the many definitions gathered from different sources, two definitions emerged as the most aligned. The fit of definition with the purpose of the credentials is important, particularly for the admission and transfer context in post-secondary education. In considering implications and opportunities micro-credentials could bring to enhance admission and transfer pathways to further post-secondary studies, this study suggests stewardship of micro-credentials in alignment with existing quality assurance frameworks and/or contexts is an important factor.

The report highlights several promising exemplars both from within Canada and internationally. The work of Thompson Rivers University to develop micro-courses, Simon Fraser University's FASS Forward microcredit courses, Algonquin College's comprehensive Micro-credentials Framework, and the New Zealand Qualifications Authority's system introduce the adoption of these credentials into the quality assurance construct. These are promising exemplars of higher education efforts to enhance the utility and confidence in quality assurance. The report provides several other examples.

Institutional respondents identified in this research indicated that the top motivator for offering a micro-credential was to support access to future studies. However, at present this motivator does not align with a demonstrated willingness to accept micro-credentials for admission, credit transfer, and stackability. This suggests a disconnection in purpose and practice, but also an opportunity for institutions to pursue.

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The data collected to satisfy objective three, exploring the human resources specialists' perspectives, remained insufficient to facilitate analysis. This represents an area of future study. Other areas to explore in the future include developing the resources and tools to maximize learner mobility. One opportunity is to collaborate with digital exchange networks, such as the ARUCC National Network, which have the ability to support badges and micro-credentials.⁷⁴ Further research should also consider good practices for incorporating micro-credentials into existing quality assurance constructs to aid future learner mobility. In addition to existing quality assurance processes within institutions, the models provided by New Zealand⁷⁵ and Europe⁷⁶ provide interesting system-level models. Establishing a credential registry to facilitate understanding and confidence in quality and pursuing pilot projects to advance micro-credentials that improve learner mobility by supporting laddering into further studies are also promising strategies.

Best practice considerations, conventions, and quality assured metrics shape the admission and transfer assessment practice. If a micro-credential is to be adopted for use in admission and transfer assessment, important questions need to be asked and answered. For example: Which institution delivered the credential?; What type of quality assured process did it go through?; What assessments were used to measure the learning achieved?; and Is the learning reflected in the micro-credential aligned with the program that the learner wishes to pursue? These questions are only some of the many considerations in quality assessment processes. Intentionally designed learning experiences that result in micro-credentials that are intended to be stackable towards further study will need explicitly to address such questions to facilitate mobility of these credentials within and across post-secondary programs and institutions.

For a micro-credential to be adopted into mainstream credential assessment practice for admission and transfer, it seems clear that designing it with an eye towards demonstrating quality and future transferability represent fundamental design principles.

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⁷⁴ <https://www.aruccnationalnetwork.ca/news>

⁷⁵ <https://www.nzqa.govt.nz/providers-partners/approval-accreditation-and-registration/micro-credentials/>

⁷⁶ <https://microcredentials.eu/>

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Appendix A: Definitions for Micro-credentials

Definitions	Sources
<p>A <u>digital credential</u> is the <u>official</u> certification of the <u>acquisition of an individual's skills or capabilities</u>. It is awarded in a digital form, which is <u>verified, secure and shareable</u> with peers, employers, and educational providers. Digital credentials can be <u>curated, annotated, and distributed over digital networks under the earner's control</u>.</p> <p>Micro-credentials also <u>certify an individual's achievements in specific skills</u> and differ from traditional education credentials, such as degrees and diplomas, in that they are <u>shorter</u> can be <u>personalised</u> and <u>provide distinctive value and relevance in the changing world of work</u>.</p>	(RMIT University, 2020)
<p>Micro-credentials are short, flexible, skills-based learning experiences that demonstrate mastery of certain skills or competencies. Some individual micro-credentials may be combined, or stacked, to earn full credentials such as a certificate or diploma.</p>	(Algonquin College, 2020)
<p>A micro-credential is a certification indicating <u>demonstrated competency in a specific skill</u>. Micro-credentials are also <u>on-demand, shareable, and personalized</u>. Learners have voice and choice in what credentials they want to pursue and can create their own education playlists.... micro-credentials are a <u>digital</u> certification indicating demonstrated competency in a specific skill. They promote <u>learning by doing</u>: educators apply their learnings in their practice, collect evidence, and demonstrate their competence.</p>	(Ryerse, Competency-based Micro-credentials are Transforming Professional Learning, 2017)
<p>(An example of a definition from the teaching profession)</p> <p><u>Competency-based</u>. Micro-credentials focus on <u>evidence of educators' actual skills and abilities, not the amount of "seat time"</u> they have logged in their learning. They require educators to <u>demonstrate</u> their competence <u>in discrete skills in their practice</u>—either inside or outside the classroom.</p> <p><u>Personalized</u>. Teachers select micro-credentials to pursue—based on their own needs, their students' challenges and strengths, school goals, district priorities, or instructional shifts. And <u>they can identify the specific activities</u> that will support them <u>in developing each competency</u>—including, but not limited to, traditional professional learning activities.</p> <p><u>On-demand</u>. Micro-credentials are <u>responsive</u> to teachers' schedules. Educators can opt to explore new competencies or receive recognition for existing ones <u>on their own time</u>, using an <u>agile</u> online system to <u>identify competencies, submit evidence, and earn micro-credentials</u>.</p> <p><u>Shareable</u>. Educators can share their microcredentials across social media platforms, via email, and on blogs and résumés. As a result, microcredentials are <u>portable currency</u> for professional learning that educators can take with them no matter where they go.</p>	(Center for Teaching Quality, Digital Promise, 2016)
<p><u>Micro-credentialing is the process</u> of earning credentials through <u>performance-based assessments</u> that showcase skills in specific topic areas.... micro-credentials are <u>like mini-degrees</u> in which you would complete an activity such as taking an online test, creating a presentation, or writing a report.</p>	(Association Trends, 2018)

Definitions	Sources
<p>Micro credentials are <u>certification-style qualifications</u> that individuals choose to study to improve a skill <u>found in a particular industry</u> area. They are <u>short, low-cost online courses</u> that provide learners with a digital certification or a 'digital badge' when complete. This new learning concept continues to gain recognition and is highly sought after within the professional landscape.</p> <p>The key difference between microcredentialing and other qualifications offered by higher education institutions – such as certificates or bachelors – is that micro credentials are delivered as 'bite-sized' chunks; <u>illustrating the proficiency in a particular skill</u>. They are developed with its particular industry in mind, ensuring that the qualification <u>meets industry-specific needs, is relevant and is recognised by future employers</u>. This new approach to professional development is personalised and generally transferrable.</p> <p>Micro credentials are also known to be called:</p> <ul style="list-style-type: none"> Digital badges Nano degrees Micro-certifications Web badges Mini degrees Open badges 	<p>(Blazevic, 2020)</p>
<p>Badges represent a <u>way of acknowledging achievements or skill acquisition at a more granular level</u> than a college degree.</p>	<p>(Educause, 2020)</p>
<p>Micro-credentials are a <u>competency-based digital form of certification</u>. They can be issued <u>for formal and informal professional learning experiences</u> that support educators developing skills and acquiring knowledge to improve professional practice that supports student success. Educators identify a competency they want to develop, submit evidence that they have mastered the competency, and receive a digital badge once the evidence is approved.</p>	<p>(National Education Association, 2002-2019)</p>
<p>Microcredentials can <u>take the form of open digital badges, e-portfolios, verified certificates, nanodegrees, or other tools that help earners gain a foothold in signaling competencies, skills, and connected networks</u> through a growing system emphasizing <u>evidence-rich credentials</u>....In contrast to the paper transcript, microcredentials reroute traditional systems of educational hierarchy, institutional power structures, and recognition of authority.... Microcredentials negotiate the space between these tensions because they <u>can be deployed in informal learning environments</u> like extra- and co-curricular activities, among peer learners, and outside the bounds of traditional accreditation.... microcredentials <u>give greater freedom</u> to how learning is designed, presented, assessed, and dispersed across <u>digital networks</u>, yet, <u>as the notion of the microcredential effectively migrates from learning artifact to workplace credential</u>, valuing systems and new inequalities may emerge. For example, early badges [a form of microcredential] are, essentially, static artifacts: they are awarded, contain criteria for learning and evidence to substantiate the claims, and persist in a digital repository. Badges [a form of microcredential] emerging recently, however, contain more dynamic possibilities like continued endorsement after the awarding.... Microcredentials, however, <u>provide a promise of a layered or stackable credential that provides competency specificity</u>.</p>	<p>(Willis, Strunk, & Hardtner, Microcredentials and Educational Technology: A Proposed Ethical Taxonomy , 2016)</p> <p>See also Jordan Friedman, "What Employers Think of Badges, Nanodegrees from Online Programs," U.S. News & World Report: Education, January 22, 2016.</p>

Definitions	Sources
<p>Like Lumina, we're using "credential" as an umbrella term that includes "certifications." The microcredential umbrella <u>includes both digital and non-digital credentials, as well as credentials earned through participation or assessment</u>. We suggest microcertifications be thought of as a subset of microcredentials, issued only when competencies are verified against a set of criteria (in other words, assessed). Similarly, we're using "digital credential" as an umbrella term that includes digital badges (e.g., a teamwork badge) as well as digital versions of paper credentials (e.g., a bachelor's degree).</p>	<p>(Pichette & Risk, 2020)</p>
<p>Micro-credentials are <u>proof that a skill or level of mastery has been earned</u> by the recipient. Think of micro-credentials as <u>mini-certifications in a specific area of study or professional development</u>, like leading a team or applying computer coding skills to complete a project. Micro-credentials are also <u>referred to as digital badges, mini-degrees, and micro-certifications</u>, depending on the person or institution issuing them. No matter their name, micro-credentials <u>represent a searchable, archivable digital certificate that easily showcasing a learned or mastered skill</u>.</p> <p>Micro-credentials <u>may originate from a classroom setting or within the workplace</u>, but regardless of the body issuing them, each micro-credential follows a similar path. First, the issuer determines the specific skills that need to be proven to earn the credential based on assignments or tasks completed. The micro-credential is named and then made available to students through a digital platform. Once a student has completed the work necessary to earn the credential, that evidence of work is reviewed to ensure its accuracy. Finally, the micro-credential is awarded, and it can easily be added to the recipient's digital portfolio.</p> <p>Micro-credentials are a <u>visual representation of knowledge and skills earned over time</u>, creating a more streamlined process for evaluating an individual's competencies.</p>	<p>(Horton, 2017)</p>

Definitions

SUNY Micro-credentials:

- verify, validate and attest that specific skills and/or competencies have been achieved;
- are endorsed by the issuing institution;
- having been developed through established faculty governance processes; and
- are designed to be meaningful and high quality.

At the most basic level, micro-credentials verify, validate, and attest that specific skills and/or competencies have been achieved. 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. Micro-credentials can be offered online, on-campus, or via a hybrid of both.... nationally, terms are often used interchangeably. For example, badging, a type of micro-credential, is often used synonymously with the term microcredential itself.... Micro-credentials may represent the content of credit or noncredit study; they may take the form of a digital badge, MOOC, or micro-award, and can be offered online, on-campus, or a hybrid of both. Micro-credentials may be specifically recognized by certain industries, in which case they may have the advantage of providing validation and attestation of industry-specified and frequently highly sought-after competencies.

Micro-credentials can be used to highlight competencies earned as part of a credit-bearing program (motivating students to persist and distinguishing students among prospective employers); serve as an introduction or entry point to a degree program (stackable); be issued as a stand-alone credential and/or complement a degree program (e.g., an English major may benefit from a micro-credential in computer science; a computer science major may benefit from a micro-credential in business writing; a computer science alum may benefit from a micro-credential on the newest programming language; and/or an education major may seek continuing professional development via a microcredential, etc.).

Micro-credentials are digital artifacts that can be used to recognize, display, and transmit information about an individual student's skills, abilities, and knowledge....micro-credentials offer learners a mechanism for displaying and sharing a wider variety of achievements than grade-point averages or typical transcripts. Digital micro-credentials represent an opportunity for innovating the admission process by providing indicators of college potential that arise from students' experiences both inside and outside of the classroom.

Sources

(State University of New York (SUNY), 2019, p. 2)

(Fishman, Teasley, & Cederquist, 2018, p. 4)

[M]icro-credentials are bite-sized chunks of education, whether an online course, bootcamp certificate or apprenticeship from a traditional university, specialty provider or online learning platform like Coursera, EdX or Udacity. (Purbasari Horton, 2020)

Many individuals already use micro-credentials to broaden their skillsets. Still, some have suggested that in the future, a prospective employee might be able to 'stack' these credentials together in place of a university degree. The idea is that it would be more accessible and provide a more affordable – perhaps more targeted – path into employment.

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