UNDERSTANDING MICRO-CREDENTIALS

i. ABSTRACT

Today's employers are increasingly looking for candidates with detailed and easily accessible list of credentials that verify skill competencies specific to their hiring needs. Digital credentials that complement traditional paper and envelope credentials, and hardcopy employment applications can help meet this need. The movement toward Alternative Digital Credentials (ADCs) is significantly changing the landscape of matching skilled employment-seekers with the jobs employers need filled. This movement toward ADCs has been characterized by some as an imperative; by providing learners with workplace-relevant, information-rich records (or badges) that can be curated, annotated, and distributed over digital networks under the learner's control, ADCs have developed their own unique 'ecosystem'. Micro-credentials, a subset of ADCs that focus on a single skill or small, discreet set of skills, are increasingly being embraced by post-secondary institutions as a means of both meeting business and industry expectations, as well as supporting and preparing well-rounded students with highly marketable skills. Through engagement with Saskatchewan's post-secondary institutions and industry stakeholders, the Saskatchewan Higher Education Quality Assurance Board (SHEQAB), with support from the Ministry of Advanced Education, can facilitate collaboration toward a common language, framework, and principles that serves all of Saskatchewan, and is compatible with other jurisdictions. The establishment of a broadly applied and commonly understood framework for ADCs and micro-credentials will enable Saskatchewan's post-secondary institutions to develop innovative educational approaches to efficiently and effectively address current and emerging labour market needs.

I. INTRODUCTION

Across Canada, there are approximately 400,000 jobs looking for qualified people and over 1,000,000 people looking for jobs[1]. This is at least partly due to a lack of recognition of what people know and can do, and what competencies, exactly, employers need.

Saskatchewan's *Plan for Growth* calls upon Government to contribute to the development of an agile and integrated education and training system by, among other things, advancing micro-credential recognition to support career development through lifelong learning. In today's fast-changing workforce and emerging gig economy, a nimble recognition system is essential for both professionals and employers, who are increasingly moving towards skill or competency-based hiring. State University of New York (SUNY) provides a useful framing of the current global context:

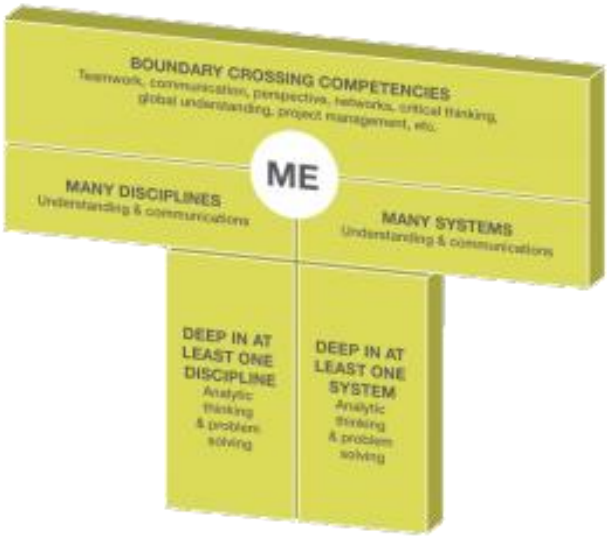
> "Today's employers are increasingly looking for candidates with more than a college degree; they are seeking individuals with detailed and easily accessible credentials that verify skill competencies specific to their hiring

[1] https://cwf.ca/wp-content/uploads/2017/02/HCC_Matchup_Report_FEB2017_WEB.pdf

needs. In response, institutions of higher education are embracing the micro-credential as a means of both meeting business and industry expectations and supporting and preparing well-rounded students with highly marketable skills.[2]

The T-shaped Learner

The model (pictured below) is a graphic representation of a graduate who has not only successfully completed a program of study in his or her chosen academic field but one who has also developed important interpersonal and workplace skills – the 'T-shaped Learner'. The horizontal line represents skills and competencies people need to be competitive in the employment market, such as teamwork, communication, critical thinking, problem solving, global understanding, project management, etc. The vertical line represents the deep knowledge acquired through academic study in a given field or major.



Increasingly, employers screen job applicants using digital search filters that seek out requisite skills and competencies, things that traditional credentials and transcripts, and to varying degrees, résumés, do not make explicit. Inevitably, however, people gain such skills and competencies over the course of their education, work, and life experiences. Accordingly, education and training providers must rethink the ways that learning experiences are designed, assessed, recorded and made visible so that deep knowledge and cross-cutting skills and competencies are explicit and easily communicated.

Alternate digital credentials (ADCs), of which micro-credentials are a significant subset, can help turn traditional résumés into digitally searchable records that make an individual's skills and competencies highly visible to potential employers.

[2] https://system.suny.edu/media/suny/content-assets/documents/academic-affairs/Micro-Credentialing-TaskForce--Report.pdf

II. ALTERNATIVE DIGITAL CREDENTIALS: SETTING THE STAGE FOR A NEW IMPERATIVE

The utility of traditional résumés and university transcripts for matching people with jobs has declined as employers use anonymous digital search filters to screen applications for specific skills and competencies. "Transcripts are useful for entry into graduate school or continuing formal (degree) education, but *as descriptors of abilities needed in the workplace*, [they] are basically useless." Institutional control through transcript fees and confidential dissemination limits public access to an individual's learning achievements.[3] ADCs present an opportunity to bridge the gap as a record of an individual's learning that is relevant and meaningful for employers. ADCs are fully digital icons or "badges". They are a digital attestation of a learner's academic credentials, and a meta-data rich record (including, for example, the name of the learner, the granting institution, the verification of an industry partner, and a summary of the assessment the learner completed to earn the credential) of an individual's skills and competencies. ADCs are rapidly transforming the higher education landscape and creating a new 'ecosystem' of skill and knowledge evaluation for the marketplace. ADCs do not replace traditional transcripts altogether, nor are they digitization of traditional transcripts; rather, "ADCs are *portable, useful, transferable, and easily understood*. [For learners and employers] ADCs offer an [alternative to] traditional transcripts because they can contain specific claims of competency and web-based evidence of those competencies. They can be curated, annotated, and distributed over digital networks under the learner's control."[4] ADCs or badges digitally attest the achievement of degrees, diplomas, certificates, and micro-credentials.

III. WHAT ARE MICRO-CREDENTIALS?

There is no universal definition of micro-credentials. For the purposes of this paper, the term micro-credentials (sometimes referred to as micro-certifications) refers to a subset of ADCs or 'badges' that are *fully digital*, workplace-relevant, and information-rich (containing meta-data) records of an individual's skills and competencies, that validate book-taught and life-learned skills in ways that job seekers and employers understand. Micro-credentials verify and attest that specific skills and/or competencies have been achieved and are endorsed by the issuing institution and other partners, as appropriate.

In short, a micro-credential is

- a single, shareable endorsement or attestation of a learner's achievement of specific knowledge, skills, or competencies;
- a digital record that can be shared on an online résumé, email signature, portfolio or website;
- a record that contains embedded data about the credential, including (but not limited to) where and when the credential was earned and the competencies assessed.[5]

[3] https://cshe.berkeley.edu/sites/default/files/publications/rops.cshe.2.2018.matkin.altdigitalcredential.1.30.2018.pdf
[4] Ibid, 2.
[5] https://humber.ca/continuing-education/credentials/micro-credentials.html

How are they different?

Micro-credentials differ from traditional education credentials, such as degrees, diplomas, and certificates, in that they are narrowly targeted, *awarded in a digital form*, and intended to highlight discreet, job-specific skills and competencies in demand from industry and employers. Whereas traditional post-secondary degrees, diplomas, and certificates may take years, months, or several weeks to complete, and provide learners with a broader-scope, depth, and breadth of knowledge; micro-credentials address labour-market-specific skills and competencies. In this way, they are not simply 'shortened' versions of what institutions have traditionally done; rather, by focusing on specific competencies they can be personalized and provide distinctive value and relevance in the rapidly changing world of work[6].

For example, an individual who has acquired WHMIS training through an employer or post-secondary institution gains particular skills in the handling of dangerous materials. Traditionally, this person would receive a certificate, or recognition of completion from the training provider. However, the *transferable skill-specific competencies* gained through this WHMIS training are not explicit in a traditional certificate, and may not be fully appreciated by *skill-specific* digital applicant screening technology increasingly used by employers attempting to match skills to jobs. If the learner is granted a micro-credential, she would also receive a digital badge or icon that can be shared on an online résumé, portfolio, email signature, or website (LinkedIn). It would contain the additional embedded data about the micro-credentials, where and when they were earned, and the competencies assessed to gain them. Further, the individual would own the credential and be free to share it as she pleases. This is because ADCs, including micro-credentials, and access to them, unlike transcripts, are not under the purview of a registrar or an institution. Although micro-credentials may be *compatible* with traditional transcripts or certificates, once awarded, micro-credentials *and associated meta-data* are the property of the learner[7].

IV. DIGITAL PLATFORMS AND MICRO-CREDENTIALS

What is a digital platform?[8]

A digital credential platform is a tool that enables the development and ongoing management of micro-credentials and ADCs in general. Digital platforms perform important functions related to the administration of digital credentials, including the creation, persistence, storage, stacking, verification and sharing of those credentials.

The integration and connectivity of digital platforms is dependent on their ability to utilize/recognize the digital credentials from different platforms. Accordingly, platforms utilizing an established standard for their digital credential (e.g. Open Badge 2.0, Open Certs, W3C) are able to recognize, share and store credentials originating from different platforms. Using a common, standard script means that even if a digital badge was created by a different issuer using a different platform, it can be recognized and stored by another digital platform using the same standard script. Efforts are currently underway to ensure the compatibility of the most common standards.

[6] https://www.ecampusontario.ca/micro-certifications/

[7] https://www.ecampusontario.ca/wp-content/uploads/2019/10/2019-10-07-microcertifications-en3.pdf

[8] Information on Digital Platforms/services have been taken from presentations from vendors (Badgr presentation on January 22, 2020; presentation from BCDIploma on February 4, 2020) as well as website materials.

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Persistence

Digital credentials adhering to an established standard script are secure records of educational attainment that are not dependent on particular platforms. This means that the digital credential is a self-sustained record of learning that is not affected by the status of a digital platform. If a platform closes, crashes, or is unavailable in some way, it does not affect the availability of the digital credential.

Storage

Many digital platforms have an associated service that allow digital credential earners to store their credentials. For example, the Badgr "Backpack" will automatically upload digital badges earned from a Badgr platform, and allow individuals to manually upload digital badges earned elsewhere. It should be noted that while there are storage features and options in digital platforms, as well as services like the Badgr Backpack, these services are not necessary. Digital credentials are owned by the individual, and can be retained (and shared) in whatever way the individual would like.

Stacking

One of the more integrated features of micro-credentials (and digital credentials in general) is the idea that individual badges/credentials can be collected and "stacked", leading toward larger credentials. Digital platforms typically contain the functionality to do this by mapping an individual's achieved competencies against the competency profiles of various jobs.

Verification and Sharing

The design of digital credentials ensures that verification is a simple process, and that the sharing of digital credentials is closely linked to the verification process. Individuals that want to share a digital credential can do so in an email (even in an email signature), and allow a viewer to click the credential (or associated link) in order to view the internal meta-data to confirm that a skill or competency has been achieved. These data can include the competencies earned (with links to outside materials that verify the associated skill/competency), associated quality assurance mechanisms, verification from industry groups, etc. In other words, the visibility of these data allows viewers to verify the earner and the credential.

Quality Assurance

Ensuring that the credential earned is of sufficient quality is a paramount concern in all education programming, and it is no different for micro-credentials. By creating micro-credentials through a digital platform, issuers of the credential are able to include any relevant information in the meta-data of that credential, which allows any interested party to view and see how the quality of a given credential is verified. These data can include information on the issuer, associated partners involved in the credential, the competencies earned (with links to outside materials that verify the associated skill/competency), associated quality assurance frameworks, associated assessments and results, etc. In other words, the inclusion of these data allows others to view more than a digital icon. The meta-data is unalterable information that has been 'baked' into the digital credential. Building quality assurance into the design and creation of the micro-credential itself avoids time consuming, bureaucratic processes and facilitates quick responses to emerging training needs.

V. NEW MODELS FOR LIFELONG LEARNING: WHAT IS HAPPENING IN OTHER JURISDICTIONS?

Advancement of approaches to micro-credentials is developing rapidly internationally. For example, in March 2018, the New Zealand Qualifications Authority (NZQA), an arms-length, central government Crown entity, produced a paper establishing a framework with common definitions and principles[9], including an application process for higher education organizations and employers to submit their micro-credential program proposals for approval by the NZQA. Once NZQA approves a micro-credential, it is published on a micro-credential register[10]. When a learner has achieved a micro-credential, the achievement can be reported to NZQA and displayed on the learner's New Zealand Record of Achievement (NZRoA). An NZRoA is an official transcript of all the New Zealand qualifications and standards that a person has achieved as reported by NZQA-accredited education organisations and Universities[11].

Similarly, with satellite campuses across Australia, Asia, and Europe, RMIT University[12] based in Melbourne, has developed a comprehensive approach to micro-credentials and digital certifications[13]. In the United States, the State University of New York (SUNY) created a micro-credentialing task force that released a report[14] in January 2018 with common principles and a framework for delivering micro-credentials. The University of California, Berkeley, released a paper[15] in February 2018 highlighting what they describe as the 'imperative' of the Alternative Digital Credentials (ADC) movement.

In Canada, recent development of micro-credentials has largely been advanced by post-secondary institutions. In 2018, Humber College launched Digital Badges to offer learners 'unique professional credentials to help steer their careers in new directions'. In addition to Humber College, several pilot projects are currently underway in Ontario. eCampus Ontario, which facilitated the establishment of a set of principles and guidelines, and secured a digital platform for the creation and use of micro-credentials, reports that 14 institutions are actively engaged in similar micro-credential pilot projects[16] throughout the province (see https://www.ecampusontario.ca/micro-certifications/). In Quebec, the Fédération des cégeps piloted a project to recognize digital skills (micro-credentials) through 24 different badges with five participating colleges: Ahuntsic, Édouard-Montpetit, Lévis-Lauzon, Limoilou, and Valleyfield. The 'badgecollegial.ca project'[17] was set to expand throughout 2019, covering many more competencies and skills.

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[9] https://www.nzqa.govt.nz/providers-partners/approval-accreditation-and-registration/micro-credentials/#heading2-7

[10] https://www.nzqa.govt.nz/nzqf/search/microcredentials.do

[11] https://www.nzqa.govt.nz/qualifications-standards/results-2/record-of-achievement/

[12] RMIT University (formerly Royal Melbourne Institute of Technology) is rated a five-star university by Quacquarelli Symonds (QS) and is ranked 16th in the World for art and design subjects in the QS World University Rankings, making it the top art and design university in Australia.

[13] https://www.rmit.edu.au/creds/creds-help

[14] https://system.suny.edu/media/suny/content-assets/documents/academic-affairs/Micro-Credentialing-TaskForce--Report.pdf

[15] https://cshe.berkeley.edu/sites/default/files/publications/rops.cshe.2.2018.matkin.altdigitalcredential.1.30.2018.pdf

[16] https://www.ecampusontario.ca/micro-certifications/

[17] http://www.badgecollegial.ca/projet/

The Digital Credentials Consortium (DCC), an international 12-member group of institutions coordinated by the Massachusetts Institute of Technology (MIT), of which McMaster University and the University of Toronto are founding members, is designing an infrastructure to distribute, issue, store, display and verify academic credentials (including micro-credentials) digitally.[18]

VI. COMPETENCY FRAMEWORKS

Micro-credentials represent short-term endorsements of a learner's specific skills or competencies, and unlike traditional credentials they target the "things people actually do and must demonstrate to be effective in a job, role, function, task or duty."[19] Micro-credentials appeal in that they offer competency-specific education opportunities designed to bridge the gap between job seekers and job opportunities. The challenge is in finding a way to match those individuals with those job opportunities, and part of that challenge is in finding a way to connect specific skills learned in programming to those needed in the labour market on a larger, more comprehensive scale.

Competency framework: a definition

A competency framework is "an instrument for the development, classification and recognition of skills, knowledge and competencies across a hierarchy of defined levels, with links to recognized qualifications and associated occupations."[20] A competency framework "includes tasks (the things people do in their jobs), the skills and knowledge required to accomplish each task, the levels of competency required by each task, and how competency is assessed."[21] This type of framework allows for a common understanding and shared vocabulary among key stakeholders, including education providers, employers, industry groups, and individuals (see image below).

The European Union's Competency Framework identifies competencies that employees of EU Member State administrations should possess, and includes a web-based self-assessment tool that allows employees to rate their proficiency level for each competency and compare it with their supervisor's assessment, allowing for developmental goals, as well as the identification of competency gaps.[22] eCampus Ontario has been leading that province's work on micro-certifications and has identified the development of a competency framework as a key component of this project, signaling its development in their work plan.[23]

[18] https://digitalcredentials.mit.edu/wp-content/uploads/2020/02/white-paper-building-digital-credential-infrastructure-future.pdf

[19] *Matchup: A case for Pan-Canadian Competency Frameworks*. Janet Lane and Jeff Griffiths. February 2017. Canada West Foundation. 2.

[20] *Matchup*, 2.

[21] *Matchup*, 3.

[22] The competency framework is a new tool to support Member State administrations in their efforts to improve their administrative capacity for management of the European Regional Development Fund and Cohesion Fund. https://ec.europa.eu/regional_policy/en/policy/how/improving-investment/competency/

[23] Information learned from direct discussions with officials from the Government of Ontario, and eCampusOntario.

The value of a competency framework: education providers, employers and individuals

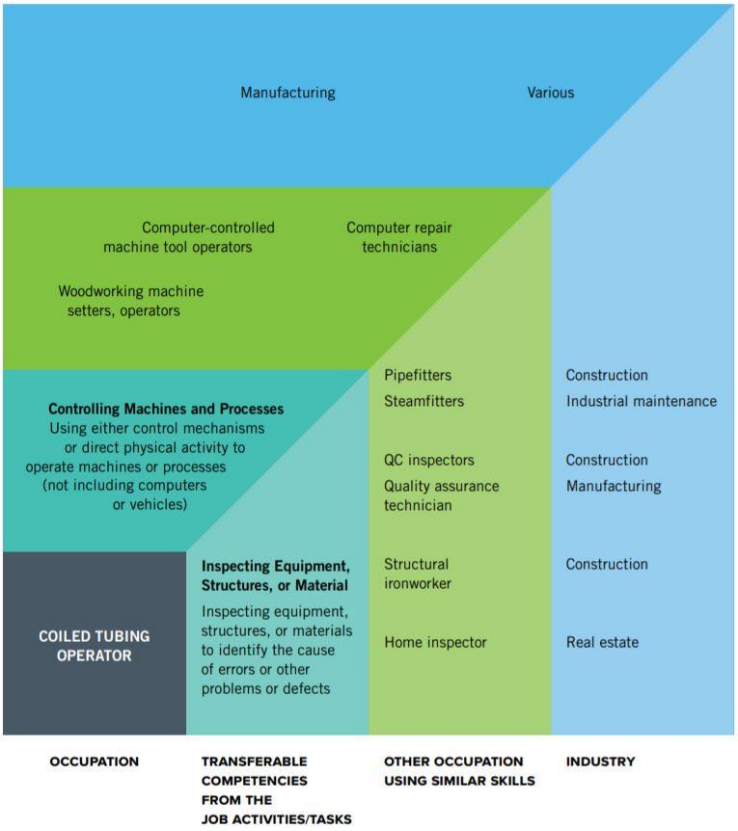
A competency framework serves to bring clarity around existing competencies and demonstrate pathways to and between employment situations. Prior to the establishment of a competency framework, "[t]here is no way of knowing […] how many of the competencies for a human resource manager are similar (or identical) to the ones needed by a purchasing agent. Intuitively it appears that there is a crossover, but there is no way of visualizing the path from one to the other."[24] Understanding what skills/competencies are held in common opens a line of sight for individuals looking to change employment, allowing them to understand what transferable skills they have, and what gaps need to be addressed.

Another key feature of a competency framework is its ability to account for a variety of skills an individual may have, particularly those obtained outside of formal academic programming. "Under a framework approach, an individual who is able to demonstrate proficiency at a level consistent with a particular academic credential would be recognized as the equivalent."[25] This doesn't mean that credentials are awarded to those individuals, but rather that equivalent skill and knowledge has been obtained.

Building a competency framework represents a fundamental change in how we think about post-secondary education. It signals a departure from traditional approaches that focus on credentials as a whole (from certificates and diplomas to bachelor and graduate degrees) as the representation of an individual's skills and competencies, and instead focuses on the specific competencies contained in post-secondary programming, as well as those skills and competencies earned outside the academy. Finally, and perhaps most valuably, competency frameworks also provide concrete linkages between the skills and competencies earned, and those required in the labour market.

Having a framework in place allows for a common understanding among employers and industry groups who can share what skills (including the level of those skills) they require in a given position, and invites education providers to articulate the competencies in their different programs, as well as tailor specific programming that directly addresses specific gaps. A competency framework "enables the assembly of competencies to define job requirements *and* credentials."[26]

[24] *Matchup*, 7.
[25] *Matchup*, 19.
[26] *Matchup*, 14. Emphasis added.



VII. FACILITATING DEVELOPMENT OF A HEALTHY MICRO-CREDENTIAL 'ECOSYSTEM'

Why 'ecosystem'?

Use of the term 'ecosystem' is deliberate.[27] "Recasting our education-to-employment system as an ecosystem better reflects the necessary interconnectedness of the stakeholders in the system (learners, employers, education providers, governments, and more) with their environments (natural, economic, cultural), and the dynamics of change that result from the stakeholders and environments impacting one another. Ecosystems are complex, connected, living, evolving."[28] Learners, employers, education providers, and governments recognize the emerging imperative of digital credentials, and this new learning ecosystem must have a common language, shared or interoperable technologies, and critical agreements between stakeholders about what data to share and how it can be used.[29] How well these connections co-function will determine the health of the ecosystem.

Given the rapid advancements in other jurisdictions, it would be worthwhile to evaluate if Saskatchewan's post-secondary institutions are aligned with the developing ecosystem on digital micro-credentials. If they are not, there may be an opportunity for the Ministry, SHEQAB, and others, to

[27] This is reflected in both eCampus Ontario's approach and the *Strada* Institute report:
https://www.stradaeducation.org/report/the-new-learning-ecosystem/
https://www.ecampusontario.ca/micro-certifications/
[28] *Strada*, 11.
[29] *Strada*, 11.

facilitate activities that align Saskatchewan institutions to operate within this ecosystem. The advantage (imperative) of providing learners with digital credentials that are quickly earned, flexible, and stackable into unique skills sets that are desirable for employers in rapidly changing workplaces is already well recognized[30]. This highlights the need for common principles and a framework for institutions in Saskatchewan that facilitates the development of a healthy micro-credentials ecosystem that serves all of Saskatchewan, and is compatible with other jurisdictions.

VIII. EXAMPLES OF OPPORTUNITES FOR INNOVATION IN SAKATCHEWAN

A preliminary scan of Saskatchewan's public post-secondary institutions' web sites indicates that there is a wide range of activity that falls under, or could fall under, the rubric of ADCs and micro-credentials. This highlights the different ideas of how micro-credentials are defined, how they operate within a broader post-secondary context, and the need for a common language and guiding principles framework.

Given that a great deal of work has already been accomplished in other jurisdictions and the imperative that Saskatchewan learners and employers are able to participate in the global movement in this area, this foundational work, while not particularly innovative, is essential. A "Saskatchewan approach" only makes sense if it is aligned with the global and national effort. This does not mean, however, that there is no room or opportunity for innovation. Indeed, the establishment of a framework and the acquisition of a suitable digital platform for the province will open up considerable opportunity for institutions and other potential providers (e.g. professional associations, employers) to implement new ideas and approaches.

Following are a few ideas to generate discussion regarding possible innovations at Saskatchewan institutions:

<u>Unlock Degrees and Diplomas</u>
Institutions that currently offer degree and diploma programming may wish to identify the skills and competencies graduates accumulate over the course of their studies and award, in addition to the traditional parchment and transcript, digital credentials that allow graduates to make their skills and competencies visible to potential employers.

<u>Attach Micro-credentials to Students' Experiential Learning</u>
Many Saskatchewan students participate in co-op and other work integrated learning experiences as part of their programs, and the Growth Plan indicates that more of these opportunities will be created. Typically, while these experiences are reflected on a transcript, the specific skills and competencies gained through these experiences remain invisible. Working with the employer, institutions could identify the skills and competencies students are intended to gain and develop online courses and/or assessments that students complete during their work placements in order to prove they have acquired the identified competencies and earn a micro-credential.

[30] https://www.collegesinstitutes.ca/news-centre/perspective/perspectives-january-14/

Provide Opportunities for Students to Earn Micro-credentials for Outside Employment

In the US, 70% of undergraduates[31] must work part-time while attending school. While the numbers may be different, we know that many Saskatchewan students face a similar situation. Institutions could work with students and their employers to identify skills and competencies gained in typical, part-time student employment situations (e.g. retail, service industry, etc.) and create online assessments that students could complete to demonstrate them, allowing the student to earn a micro-credential.

Partner with Industry Clients to Develop Competency Gaps and Appropriate Micro-credentials

There is almost unlimited potential for institutions to enhance the work they already do with their key industry clients by using the principles and guidelines that will be developed and a digital platform to begin issuing micro-credentials to employees/learners that complete custom training programs. This will provide the micro-credential earner with persistent, portable, verifiable evidence that they have gained particular skills and competencies and that can be used for future employment situations.

IX. SUMMARY

Many Saskatchewan post-secondary institutions are currently offering programming that they identify as micro-credentials but it is clear that there is disparity among post-secondary institutions as to what micro-credentials are, with no associated guidelines or standards to shape this work either within institutions or the post-secondary sector more broadly. Understanding and adopting the ideas and principles related in this paper will be crucial first step for Saskatchewan post-secondary institution's active participation in a province-wide micro-credential ecosystem.

The concept of the T-Shaped learner provides an opportunity to look at the learning experience in a different way. The tacit assumption that learners pick up broad boundary-crossing skills, as well as in-depth knowledge is made explicit through the T-Shaped Learner model, and invites education and training providers to think specifically about the skills and competencies earned in their programs, as well as how these programs are represented for learners and employers. The identification of micro-credentials (and ADCs more generally) as skill/competency-based credentials that are awarded in digital form further sets them apart from much of the work currently underway in Saskatchewan. To date, Saskatchewan institutions have not demonstrated that they are developing and awarding credentials (complete with the attendant metadata and digitally shareable credentials/badges) in a digital environment.

The agreement of post-secondary institutions, employers, industry groups and government coming together on a common language, framework, and principles is important. It will mark a crucial first step in establishing an ecosystem where micro-credentials can move from self-identified programming at a single institution into one of a variety of competency-based credentials that are awarded in a digital environment and recognized by other education providers and employers. It will also enable innovative, efficient, and effective new approaches to meeting Saskatchewan's education and training needs.

[31] Education Design Lab presentation, February 21,2020.