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Microcredentials: A Novelty or a New Pedagogical Model

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Abstract
Microcredentials are short forms of active learning where learners focus on skills & competencies rather than time. With a growing emphasis on learners as the foremost body within education, knowledge acquisition using microcredentials supports students in constructing knowledge themselves. Bloom's revised taxonomy guides meaningful learning in higher education, promoting effective, remarkable thinking. Pathway-oriented, flexible, and relevant, microcredentials accommodate learning in bite-sized pieces, addressing a skills gap, meeting labor demand. The flexibility of this type supports new models of pedagogy, allowing institutions to reach more learners, expanding, and intensifying conventional higher learning platforms. By embracing and integrating the concept of the microcredential, stakeholders to the microcredentials eco-system including students, educational systems, government, and employers will each derive many benefits. With specific examples, this work describes an understanding of the wide-ranging value microcredentials provide to stakeholders as a new, educational option. Using case examples from the tourism sector on Cape Breton Island, and additional examples from around the world, we identify new ways of thinking that are outside of the box, constructing innovative pathways to knowledge acquisition.

Keywords
microcredential, pedagogy, skills, industry, learner, education, constructivism, evaluation, experiential, life-long learning, community economic development, collaboration, stakeholders.

Forward
With Microcredits and microcredentials gaining momentum in a wide scope of industries across the globe, this paper is a timely strategic evaluation of microcredentials as a viable pedagogical approach for post-secondary institutions. Using newly acquired learnings related to our development of tourism-related microcredentials at Cape Breton University's World Tourism Institute, we developed a high-level exploration of concepts and applications related to microcredentials, with the goal of shedding light on their pedagogical value in higher learning.

Research Framework
A secondary research methodology was employed in the creation of this work. Current industry observations and actions have been examined and incorporated from available published findings in several scholarly journals and publications as well as a targeted online scan. Using a systematic, investigative approach, existing data was observed and collected from a variety of channels. These channels included higher learning platforms, educational institutions, current microcredential frameworks, industry players, government, and learners themselves. The resulting short paper has led to a deeper level of understanding of microcredentials and their

practical implementation and value in a post-secondary environment. The results were analyzed and presented in a narrative form.

Introduction

Microcredentials are an innovative, new educational avenue that supports the acquisition of skills and competency-based learnings in ways that are flexible and readily accessible for learners, increasing the employability of industry participants and students of all ages. They are a form of rapid training that helps match individual skill sets with demands of employers. Delivery formats are flexible, in-person or virtual. They offer the potential to fill skills gaps in current and future labour markets. Micro-credentials make it possible for higher education to become more convenient, flexible, and attainable, therefore more inclusive, and diverse.

A digital badge is the visual representation of a microcredential. A microcredential is industry-recognized. Selvaratnam & Sankey (2021) has found that to stay relevant in the twenty-first century with ever-changing demand for job skills in the market, continued upskilling and reskilling is pivotal for employability (Selvaratnam & Sankey, 2021). Many micro-credentials are co-developed with industry or based on statements from industry organizations about the skills and competencies they are looking for. By preparing learners with the "right" skills to enter the job market, microcredentials enhance employability (Brown et al., 2021; Miller et al., 2020; Selvaratnam & Sankey, 2021).

Microcredentials are modular and stackable. Some micro-credentials are singular learning and assessment experiences, while others are modules that can be stacked to create a qualification. Orman et al., (2023) states, "micro-credentials have the potential to challenge or complement traditional ways of how learning is taking place, understood, recognized and certified," (p. 14).

Assessments are an essential component of a microcredential. They should align with noted learning objectives and competencies and should be intentionally selected to measure whether the learner has successfully mastered a specific skill. The use of micro-credentials provides multiple forms of assessment, including instructor, peer, and self-assessment (Gibson et al., 2016). It must ensure the holder has demonstrated they have acquired the targeted skills and is ready to apply them in practice or in the workplace.

Microcredentials and the Active Learner

There is a growing emphasis on learners as the foremost body within education. Active learning is the focus. The emphasis in active learning is on skills and competencies rather than on content. Ahsan et al., (2023) noted "In microcredentials-based learning and badge earning, the student is the core stakeholder," (p. 13). Through various activities, students develop problem-solving, critical thinking, and reflection skills. In addition to learning specific content, students are putting skills into practice, while learning how to learn.

This can be considered a Constructivist approach to knowledge acquisition. Learners construct knowledge for themselves. Meaningful learning is promoted through active learning, collaboration, viewing a problem through multiple perspectives, reflection, student-centeredness, and authentic assessment. Knowledge construction develops in a collaborative

learning environment where students communicate by sharing information in groups for solving given tasks (Dillenbourg & Fischer, 2007; Alavi & Dufner, 2005; Crook, 1998). Constructing meaning is learning; we must focus on the learner in thinking about learning and not on the subject or lesson to be taught. Rigorous instructional design rooted in sound pedagogy is a fundamental principle of successful learning.

Higher Education (HE) and active learning through the context of microcredentials can be guided by Bloom's Revised Taxonomy; a framework that is predicated by a constructivist approach. Active learning can be described as a pedagogical process where students engage in the learning process through problem solving, case studies, or role play. Problem-based learning (PBL) is a popular active learning pedagogy which fits into the constructivist educational paradigm as both a curriculum and a learning philosophy (Maudsley, 1999; Savery, 2006). Active learning as a philosophy becomes most effective when students must demonstrate high order thinking skills; skills that appear higher up on the pyramid of Bloom's taxonomy. Analyzing, applying, and evaluating allow learners to tackle problem-solving, grasping concepts through reflection and a hands-on approach to knowledge acquisition. Thus, information becomes more meaningful through association and exchange. The nature of microcredentials as an innovative pedagogical tool means in the moment participation, exploring and learning by applying new knowledge, skills, and attitudes in creative ways. The growing trend in the use of MICROCREDENTIALS in higher learning is indicative of an emerging shift towards competency-based education (Blackburn et al., 2016). Verb-based expectations related to understanding, applying, analyzing, evaluation, and creating are at the core of this form of learning experience. Microcredentials build upon the demonstrated success of Bloom's Revised Taxonomy, promoting mastery of learning and effective, remarkable thinking. This is learning by doing.

Microcredentials and Post-Secondary Education Institutions

Microcredentials are pathway oriented. They are most relevant when tied to industry and/or community need, acting as a conduit through which necessary resources and strengths can be conveyed. Carnevale et al., (2015) states, "Through micro-credentials, higher education pathways can potentially be created to support the continual acquisition of industry-relevant credentials even when people lack time or money to pursue a full degree program," (p. 3). Microcredentials can be stackable, accommodating and promote learning. They can be part of a sequence of learning which leads to a larger credential. Allowing for the collection of related skills, microcredentials provide pathways for learners to progressively gain knowledge, and advance careers.

Microcredentials are flexible; the pace and/or structure of content can be customized. Microcredentials fit well into the concept of life-long learning because learners can adapt the learning pathway as they go along, to suit their interests and abilities. They enable modularization and offer different learning options to learners in initial education, while also supporting lifelong learning, which is seen as important in the context of aging populations (OECD, 2023). Microcredentials demonstrate higher education's belief in life-long learning. They address the engagement crisis in higher learning through a constructivist approach, one that is experiential, hands-on, engaged, where active learning is key. The flexibility supports new

models of pedagogy, allowing institutions to reach more learners, expanding, and intensifying conventional higher learning platforms.

Students, Educational Systems, Government, and Employers are the four main stakeholders to the microcredentials eco-system. Microcredentials offer a high value to students of all ages. Their affordably complements current education. They can be issued by traditional education institutions, industry providers or private providers of learning, whether online, onsite or both (Milian 2021; Oliver 2019). For educational institutions, microcredentials are a new pedagogical model. They offer value-added capacity for graduates who wish to articulate specific skillsets and competencies. Introducing microcredentials in HE holds the potential to change how HE institutions offer degree programs and students acquire their qualifications (Greene, 2019; Lockley et al., 2016). Government & Employers benefit from the widespread popularity and authentic value associated with microcredentials. They help fill skills gaps in the workforce, connecting skills acquisition with labour market and community need. The main reason for such a development is evident across various industries: employers may value job applicants' skills more than the degrees they have accumulated (Lam 2015; Purbasari Horton 2020). Microcredentials represent a holistic component of community economic development, while increasing meaningful collaboration between government and higher educational institutions.

Stakeholder-Centered Pedagogy

Much research exists on the description and comparison of student-centered and teacher-centered pedagogy. It could be argued that microcredentials include but exceed these two conventional approaches and are instead stakeholder-centered pedagogy. Mascolo, M. (2009) offered that "all learning is thus viewed as a form of doing. Pedagogy becomes a task of articulating learning goals and identifying the forms of doing that promote development toward those goals" (p. 3). While not referencing microcredentials specifically, this description applies well to microcredentials.

By focusing on student-centered learning where engagement is natural and relevant, microcredentials allow students and employees to find their own voice and to discover their own abilities. Brown, et al., (2021) stated "As the skill demands continue to change, people will continually need to re-train, reskill, or redeploy to avoid redundancy and social and economic displacement in their local communities" (p. 7). This reskilling is often at the encouragement, hosting, or investment of an employer or potential employer with industry needs shaping curriculum. A current example of industry-driven educational programming was identified when, in October 2022, microcredentials were introduced to the Unama'ki Cape Breton Island tourism industry. As of November 2023, hundreds of learners had earned digital badges across nine different topic areas. The participants gained or updated industry-relevant skills and the sector overall has increased its service capacity. The higher education institution, Cape Breton University, has strengthened its ties with one of the most important economic generators on Cape Breton Island. The impetus for this educational project was not the University, nor did it stem from student demand. These microcredentials were driven by a recognized need for retraining and reskilling of the workforce and potential workforce with the goal of becoming a more competitive tourism destination.

Varadarajan et al., (2023) examined the needs and perspectives of microcredential stakeholders concluding that these short-term modules can be useful to higher education institutions as a pathway to connecting to new learners, connecting to employers, and connecting to government by offering qualification frameworks (p. 13).

Microcredentials at Work

Microcredentials mean different things to different people. How jurisdictions structure their microcredential delivery also differs, although there are common characteristics. An extensive online search identified numerous examples of industry applications and stakeholder driven microcredential offerings. The New Zealand Qualifications Authority is widely considered the leader in microcredential development having created a centralized regulatory framework in 2018 (Fisher & Leder, 2022), along with a centralized application system for participants who can search by institution or topic. The framework includes an assessment system for developers of microcredentials and currently offers 360 distinct topics from accredited education providers. It is stated clearly that microcredentials are developed because there's evidence they are needed, which is evidence of the critical role of stakeholder influence and involvement (NZQA, n.d.).

In the United States, there is no national system of quality assurance, registration, or delivery of microcredentials. The National Education Association develops and delivers more than 175 microcredential options for their member educators as part of their robust professional learning opportunities (National Education Association, n.d.). There is no centralized system in Canada although there is a Microcredential Council of Canada, but it is not credibly representative of post-secondary institutions (Micro-Credential Council of Canada, n.d.).

Microcredentials are gaining traction across Canada. Colleges and Institutes Canada, known as CICans, is a nationally recognized organization with approximately 140 post-secondary member institutions. In 2021, it published a Microcredential Framework as an attempt to formalize a common approach and expectations associated with microcredits throughout Canadian post-secondary institutions (Colleges & Institutes Canada, n.d.). Exploring the progress in Atlantic Canada, it is obvious that microcredential development momentum has begun. In Newfoundland & Labrador, Memorial University is developing digital badges to support their students' interests and enhance their career preparedness (MUN, n.d.). In Nova Scotia, the provincial government's department of Labour, Skills and Immigration has established a Program Director role specifically focused on microcredentials. According to the job description, this Program Director "…will lead the implementation of the Nova Scotia Microcredential Framework in 2023 which shapes how microcredentials fit into the continuum of learning options available to Nova Scotians," (Nova Scotia Dept. of Labour, Skills, and Immigration, n.d.).

Dalhousie University in Halifax, Nova Scotia, launched an innovative effort seeing the development of more than 40 microcredentials by 2023, offered through their Faculty of Open Learning and Career Development. Skills range from Inclusive Education Planning to Forensic Investigation and from Performance Coaching to Positive Culture Planning. The microcredentials

available currently range from those in Agriculture, Business, Information Technology, Mental Health and more (Dalhousie University, n.d.). The Nova Scotia Community College (NSCC) offers fully funded microcredentials designed to enhance credibility with employers (NSCC, n.d.).

Cape Breton University's microcredential project began more than a year ago with research by a cross disciplinary team exploring the requirements of a robust and relevant suite of short-course offerings. They have invested in this new educational approach by hiring a Senior Project Manager responsible for microcredential delivery (Cape Breton University, n.d.). The World Tourism Institute (WTI) at Cape Breton University was the first to develop and launch microcredentials at the institution and they did so as a pilot project with the approval of an internal oversight committee. Since 2022, the World Tourism Institute has developed nine separate microcredentials focused on the tourism sector's needs, to strengthen the industry's recovery in a post-Covid world. Both classroom and e-module options are available, offering flexible and convenient delivery (World Tourism Institute, n.d.). The common foundation of all microcredentials is the need to close industry gaps. The WTI microcredentials accomplish this and do so while reaching a predominantly rural tourism sector.

Future Research Opportunities

This paper explored multiple developmental contexts and identified several factors contributing to the design and application of microcredentials. Future research opportunities quickly emerged. For example, an expanded study could examine and compare the benefits of offering microcredentials as an embedded component within other credentials such as an undergraduate degree or being offered as a stand-alone educational option available to students and other adult learners alike, value-adding the student experience. Additional future topic areas for exploration could include the following.

1. Quality assurance procedures: Identifying established and reasonable quality assurance procedures within educational institutions for the development of microcredentials.

2. Authentic assessment models: A comprehensive analysis of appropriate assessment models applicable to a variety of industry sectors in a rural landscape would be a beneficial contribution to the topic of microcredentials.

3. Promotional plans for microcredentials in rural communities: Examining ways learners of all geographies come to know, understand, and embrace the opportunities associated with microcredentials.

4. Current examples: Identification of successfully completed stackable microcredentials in tourism industry.

5. Partnership opportunities amongst stakeholders: Identification of meaningful collaborations for microcredential delivery where student and employer success is the main goal.

Conclusion

We know that microcredentials are designed to meet both student career goals and the needs of industry. We know they are gaining traction, and we know that they have global appeal and recognition. This examination of microcredentials as a suitable pedagogical approach and the role they have in post-secondary institutional environments is timely and relevant to the topic of workplace education and career preparation. An increased number of government departments and post-secondary institutions are building and sharing microcredential frameworks outlining regulatory and quality assurances processes.

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