The Role and Impact of Microlearning on the Future of Business Education

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The roles and responsibilities of higher education in meeting the emerging skills and talent needs of the global workforce are changing rapidly. Employers are demanding highly skilled graduates who are continuous learners capable of meeting the shifting technological and business needs or organizations. Today academic diplomas and degrees are being substantiated, and in some cases, being replaced by micro credentials and digital badges. This paper provides a comprehensive overview of the scope, explosive growth, issues, and challenges of microlearning in business education. It discusses the eco-system of micro-credentials and digital learning and offers an understanding of the impact of microlearning platforms on business schools. The American Association of Colleges and Schools of Business (AACSB) 2020 Guiding Principles and Standards for Business Accreditation is now encouraging schools and colleges to take a holistic view of student learning and to embrace micro-learning. This paper describes AACSBs embrace of micro-credentials as a valid pathway to educate and prepare business students to meet the demands of a global workforce. This paper makes an important contribution to business education as it integrates AACSB principles and priorities to digital badges.

Keywords: Micro-Credentials, Digital Badges, Open Badges, AACSB, Business Education.

1. Introduction

At its core, the role of education is the consistent and systematic development and acceleration of human potential to meet the changing talent needs of employers and society at large. This dynamic and ever-changing societal pursuit is essentially a match-making process in which knowledge and skills are continually calibrated and delivered to meet the present and future talent demands of society. Over the centuries, institutions of higher learning were almost exclusively held responsible for delivering, assessing, and ensuring the currency of the workforce skills and knowledge of its citizens. However, today, higher education is no longer regarded as the exclusive or ideal source to meet the dynamic needs of a workforce that is caught in the grip of rapid change.

Higher education is under attack from many sectors including taxpayers, employers, government, and even an institution's key stakeholders, namely, students and parents (Meckler, 2022). Today many view colleges and universities as a mammoth white

elephant that is no longer nimble, agile, or proactive to meet the complexities of a fast-changing world. As early as 2016, in a Pew Research Center survey, 47% of the respondents stated that the primary function of a college education was to impart and develop workforce skills, while 49% with a four- and 43% with a two-year degree agreed that a college education delivered on this need (Pew Research Center, 2016).

A tsunami of macro forces including the decimation of long-standing industries, the birth of revolutionary AI applications, products, and services and their impact on workforce productivity, declining college student enrollment, the growing number of employers who no longer require a degree, and COVID-19 have created exceptional challenges for higher education. (NPR, 2022) Laszlo Bock, Google's former SVP of People Operations emphasizes that drive and determination must be valued and rewarded because "when you look at people who don't go to school and make their way in the world, those are exceptional human beings. And we should do everything we can to find those people." (Glassdoor, 2021)

This has created both challenges and opportunities for its leaders who have no choice but to rethink the very core and purpose of higher education. The pandemic alone drained higher education of more than one million college students many of whom abandoned or temporarily paused their pursuit of a degree for a multitude of reasons (NPR, 2022). The social and economic challenges of COVID-19 propelled employers and educational institutions to revisit, analyze, and define the role and influence of just-in-time modular learning as a pathway to prepare and enhance job-readiness of college dropouts, non-traditional adult learners, and employees who needed upskilling (Sousa-Vierra, 2023).

COVID-19, along with rapid and increasing competition from private learning platforms, demanded institutions of higher learning embrace, explore, and accelerate creativity and innovation by building new models of pedagogy, learning, and skill development backed by trustworthy and verifiable evidence-based credentials. While traditional methods of evidence, such as college degrees, were proof of skill development, knowledge acquisition, learning, and mastery, and are still highly valued, college degrees are no longer the *only* way or the ideal pathway to build and sustain a skill-centric workforce (Ezeiza & Barroso, 2022).

Microlearning (MC) has attracted the attention of educators and employers because of its potential to impact and transform the current and future workforce through ongoing skills acquisition for learners, lifelong learning opportunities, and just-in-time or on-the-job workforce training. Business leaders and governments have since then actively sought to accelerate short-term and innovative educational pathways, such as microlearning, to close the skills gap that employers across the globe continue to face and lament (Fanshawe & Burke, 2022)

The notion of module-based just-in-time learning or microlearning is not a new or innovative educational concept. It was considered a valid educational pathway even before COVID-19 was recognized with digital badges that were shared as evidence of skill attainment. Digital badges first originated in the world of electronic games, where a badge symbolized the skill levels of players. According to Wikipedia, in 2007 Eva Baker, the President of the American Educational Research Association (AERA), in her annual address proposed the innovative idea that digital badges could serve as proof of learning and skill acquisition in higher education. She advocated the notion that skill-based badges could be shared within the digital ecosystem of employers, higher education institutions, and influential stakeholders to establish one's

professional credentials. Digital badges have steadily become artifacts and digital showcases of accomplishment, motivation, learner engagement, professional advancement, and capacity for self-learning.

The purpose of this paper is to provide a comprehensive overview of the scope, explosive growth, issues, and challenges of microlearning in business education and integrate our findings within the framework of AACSB principles and guidelines. While there are a number of papers on digital badges, in general, and some are even discipline specific, there is a gap in the literature in terms of the role of digital badges within the AACSB framework. We are facing an exponential rise in microlearning platforms, sources, and outlets and the breadth and competency levels of skills that are being delivered outside of higher education. Hence, a deeper understanding of the impact of microlearning platforms on business schools is essential for business leaders and educators to make an informed choice about the impact of microlearning on business curricula and accreditation. This paper briefly examines the research on assessment methods to establish the long-term value of these artifacts on critical thinking, problem-solving, communication skills, and ethics. It explores factors that influence the shelf life and value of a micro-credential.

2. What are Micro-Credentials?

2.1 Basic Definitions and Concepts

"Micro-credentials build on graduate attributes, employability skills, and 21st-century skills, and take these to their logical conclusion, which is that learning is about work, that the purpose of learning is to prepare individuals for the labor market, and that this can be achieved in small bite-sized chunks." (Dyjur & Lindstrom, 2017). Envision a world in which short, highly focused, perfectly customized, just-in-time stackable modular learning units deliver a precise or well-defined set of verifiable and valuable workforce skills that are instantly and effectively deployable to solve business problems and capture business opportunities. This way of learning and earning, where the burden of opportunity to continuously expand one's knowledge and skills is shared between the learner and the employer, is already here (Bell, Liu et. al., 2022)

Micro-credentials are not a futuristic idea, but a rapid and steady force that is strengthening and shifting the landscape of how and when curriculum is delivered, how learning happens, and how performance is measured. Leaders in higher education are challenged to creatively manage the profound impact of micro-credentials on how business schools and colleges currently deliver value and prepare graduates with 21st-century skills. Business schools are now pressed to work closely with employers who are today more open to a diverse portfolio of "evidence of work-related knowledge and skills" than just a college degree. In 2021 Glassdoor, a global company that tracks employment trends, noted the rise in global giants such as Google, Ernest Young (UK), Hilton, Apple, Starbucks, IBM, and Bank of America, who no longer require a degree (Quereshi, 2020).

In short, the focus has shifted from "higher education" to "continuous life-long education" that keeps up with a world in which rapid response to macro forces is the key strategy for survival. Figure 1 shows the growth in digital badges and micro-learning from 2020 - 2022. The growth in badges has softened from the 82% growth rate from 2018 – 2020 to 10% in the 2020 – 2022 survey. This provides continuing evidence that the growth in badges is strong. (imsglobal.org)

Figure 1

Today many stakeholders, including governments, businesses, educational institutions, funding agencies, and non-profits, view microlearning as a valuable, timely, less expensive option, and trustworthy evidence of continuous learning and professional growth. The role of microlearning in preparing the next generation of college graduates has become a strategic, comprehensive, and interdisciplinary discussion around the world. Microlearning credentials are becoming a 'common currency' in postsecondary education around the world. In the United States alone policymakers in several states are taking measures to fill the skills gap. "*In recent years, nearly every state set, or is revising or adopting, an educational attainment goal. Most states are aiming for 55 to 65 percent of their citizens to earn a post-secondary credential by 2025, and nearly all face challenges to meet their objectives. In 2015, the national average attainment rate for ages 25-64 was 45.8 percent, which included workforce-relevant certificates. State attainment percentages ranged from 32.9 to 55.2 percent"* (Ghasia & Machumu, 2019)

In 2015 (Gibson et al.,2015) stated that the field was too young to draw firm conclusions about frameworks, trends, and impact, to name a few. However, today micro-credentials are a global phenomenon (Pichette & Rizk, 2020). Today there is a growing body of literature and evidence about the increasing role of micro-credentials as a mega force that will reshape and reform higher education and workforce training, which may include on-the-job training. Micro-credentials of varying scope, rigor, authenticity, and merit are awarded by local, national, and international corporations, professional associations, colleges and universities, governments, and for-profit organizations that range from beginner to advanced levels across a wide array of disciplines and industries. Innovations that disrupt traditional industries like higher education have five pillars, according to Rogers (2003). These include the relative advantage of the innovation to key stakeholders, compatibility with existing strategies and goals, complexity of the innovation, trialability or opportunity to explore without penalty and finally, observability. There is now evidence that digital badges, which were once considered an innovation, is now in the evidence-gathering stage.

2.2 Terminology

The terms microlearning, digital badges, digital credentials, and open badges are interchangeably used in the literature. There is no universally accepted definition of

microlearning because there are many concepts of what constitutes microlearning. Defining what qualifies as microlearning and/or micro-credentials is critical as it has long-term consequences for the current and future workforce, employers, educational institutions, accrediting agencies, workforce development agencies, policymakers, and governments. There is an emerging consensus around common characteristics and elements fundamental for learning modules to qualify as micro-credential. This section provides a sample set of definitions and multiple perspectives of diverse constituents and evaluators (Noyes et. al., 2019). Microlearning is defined as microcontent that focuses on a single topic or idea with a specified learning time. Micro credentials are recognition for skills and knowledge but are considered less than full academic degree, although it can complement a diploma or a degree or some level of higher qualification (Kato et. al., 2020). These are often short and specific units of learning that can be stacked to prove sustained and increased levels of learning and accomplishments. Micro learnings are often awarded digital badges that can be displayed and shared by individuals with communities of professionals. Micro credentials are designed to meet emerging skills and knowledge that are in high demand. "*While there's no official microlearning definition, all microlearning-based training shares one key characteristic: brevity. These could either be* small learning units or short-term learning activities. *It's the more engaging, less time-consuming, and cheaper-to-produce sibling of regular e-learning" Andriotis (2018).* According to UNESCO, micro-credentials are increasingly promoted as a more flexible way of recognizing knowledge, skills, and competencies. They give learners and employees the possibility to collect and combine smaller units of learning according to their specific needs and, as such, are often seen as facilitating lifelong and life-wide learning (*www.unesco.org).*" Micro means mini or small and a credential is a qualification. These mini qualifications can help individuals learn new skills, progress in their careers, or change careers entirely. Also known as micro degrees or nano degrees, they are often on-demand online courses that can be completed in your own time and provide certification upon completion. They are designed to be fast, accessible, and specialized." (McGreal &Wolcott, 2021). In conclusion, while there is no universal definition of microlearning, there is plenty of common ground in the characteristics that define microlearning.

2.3 The Ecosystem of Microlearning

A micro-credential is the "award" or recognition a student receives that showcases the details of a specific microlearning module and is embedded and supported by rigorous technical ecosystems. These ecosystems provide evidence of achievement in the form of tamper-proof, verifiable, authenticated, and shareable digital badges, sometimes referred to as open badges, based on a set of criteria-driven assessments that an individual has achieved mastery of a content module or a specific hard or soft skill. The primary goal of ecosystems is to create a high-quality framework that guarantees the authenticity of issuers and learners, facilitates visibility, sharing, and transferability, and makes it seamless for employers to identify potential employees with specific skill sets or manage and assess the learning and training of current employees (Carnevale et. al., 2021, Cumberland et. al., 2023, Arslan et. al., 2022).

The Open Badge System was introduced by the Mozilla Foundation more than a decade ago, and today there are several ecosystems of smart digital learning badges,

such as Credly, Accredible, OpenBadges.me, and Badgr, to name a few. Institutions have built their customized ecosystems for digital badges. For example, Penn State built its digital badge platform (which was recently decommissioned). In some cases, universities partner with potential employers as this creates a pipeline of graduates ready to meet the talent needs of the emerging workforce. Digital badges that are delivered using the Open Badge Infrastructure standardize digital badges regardless of who issued them or when it was issued. Learners can, therefore, accumulate badges from different sources and showcase their competencies in different areas in one digital location or slice and dice the badges, depending on the needs of the learner and the employer.

Today, learning ecosystems that support digital badge ecosystems are on the rise. Badge ecosystems create an interactive platform for knowledge providers, learners, employers, accreditors, evaluators, and other stakeholders with primary or secondary responsibility to ensure the authenticity of skill acquisition and transferability of badges. The goal of these ecosystems is to create rules, processes, and protocols through which badges are recognized as meaningful indicators of skill accomplishment and progress toward higher-order competencies in one's profession or professional pathways.

Digital badge ecosystems help learners identify and acquire the appropriate micro-credential from a variety of digital knowledge-delivery outlets. Using learning pathways, learners can enter at any given "gate" based on their skill level and career goals and exit at any point. The learner can keep climbing the "ladder of skill-based accomplishments" using stackable credentials that can be acquired by staying on the same learning pathway or switching pathways. For example, 83% of learners enrolled in business courses in Coursera are taking "beginner level" courses while 15.9% are enrolled in intermediate level, and only 0.8% are enrolled in advanced level courses (Gray Associates, 2023**).** Digital badge eco-systems minimize and, in some cases, even eliminate, the bureaucratic processes that dissuade, discourage, or frustrate learners. For example, most digital ecosystems will record, verify, authenticate, store, share, and showcase a detailed view of the knowledge and skills acquired by the learner over an extended period across multiple disciplines and pathways.

The eco-system of micro-learning consists of several key components listed below that are designed to authenticate learning, achievement, authenticity, and transferability.

1. The issuer of the digital badge: Who is the provider of the knowledge or skill set? What are the credentials of the issuer?
2. Recipient of the badge: What is the detailed profile of the badge recipient? When was it awarded? What prerequisites were needed to earn the badge? What are the learning pathways that the student can pursue to earn the next competency badge?
3. Specific skill or knowledge content: What specific skill or knowledge was delivered? What are the detailed curriculum contents of this knowledge transfer?
4. Performance assessment: What evaluation criteria were deployed to assess the skill mastery and learning of the learner? What assessments were used (quizzes, projects, etc.) did the student complete? What was the duration of the course or learning module? What is the "shelf life" of the proficiencies acquired by the learner?

5. Transferability: What is the transferability or mobility of a specific micro-credential? How can the learner claim the credential, showcase, and share it, and create a "backpack" or portfolio of credentials?

The above information is often captured in the form of metadata (data about data) that is embedded within the micro-credential. The metadata that is embedded in the badge provides information about the issuer, the level of mastery, specifics on the skill or knowledge proficiency achieved, assessment methods used, and the shelf life of the badge. This digital information can be shared on almost any digital platform, such as LinkedIn, Facebook, Twitter, and other social media platforms (Gibson et al., 2015; Gregg et. al., 2022, Lang et. al., 2023, Roy& Clark, 2019). The power of digital badges cannot be underestimated. Unlike a degree or an academic transcript that does not provide any in-depth information about the content and skill level of the learner, a digital badge allows any employer to evaluate the true merits of the knowledge and content of the learner and its applicability to a specific job or industry.

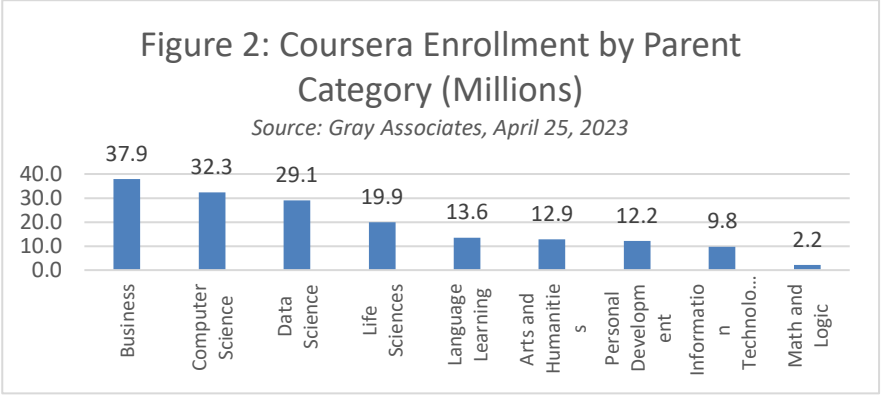
Microlearning ecosystems are sometimes viewed as a growing competition to business schools. But in essence, these systems can be powerful and inexpensive parallel or sequential learning platforms and supplements that institutions of higher learning can leverage to give their students an edge in the workplace. Rigorous systems for digital badges can be partners that help universities capture the formal and informal learning that takes place inside and outside the classroom. By sharing these experiences with potential employers, it can assist learners to expand and showcase the portfolio of competency-based skills and leadership roles and activities of graduates, which can significantly increase their value in the workplace. "*A digital badge approach, therefore, offers the potential to capture a more holistic, detailed reflection of a student's learning experience and educational achievements***"** (Brown et. al., 2021).

3. AACSB and Microlearning

Microlearning when integrated with a rigorous business curriculum and experiential learning delivers value to graduates and employers. The American Association of Colleges and Schools of Business (AACSB) *2020 Guiding Principles and Standards for Business Accreditation* defines microlearning as follows*: Microlearning credentials are certifications granted by assessment of mastery of a specialized competency. Such credentials may sometimes be "stackable," or combined to collectively satisfy the requirements of a degree program. Minors, certificates, and badges are common microlearning credentials.*"

The above definition redefines the learning opportunities and pathways available to business students to prove their competencies and invites institutions of higher learning to be innovative, creative, and agile in how they deliver relevant and timely curricula. First, AACSB emphasizes that microlearning certifications should effectively assess "mastery of a specialized competency." This aligns with employers who seek specialized competencies in graduates that meet organizational talent needs in business, technology, and soft skills. For example, specialized function-based competencies can be in areas such as HR, marketing, supply chain, finance, accounting, analytics, or other business functions. It can be technology-based content and skills assessment in areas such as cloud computing, machine learning, artificial

intelligence, visualization, geographical information systems, networking, and cyber security. Figure 2 provides a breakdown of cumulative enrollments on Coursera as of April 2023 (Gray Associates).



The data in Figure 2 highlight the breadth of professional areas that are using Coursera's platform for skills development. Topics that fall within the parent category of Business are the most popular with nearly 38 million enrollments as of late April 2023. Computer Science and Data Analytics are also popular with learners. As mentioned elsewhere in this paper, medical professions are using microlearning to upgrade skills. Coursera's Life Science parent category has had nearly 20 million enrollees, supporting the notion that science and medical professions are increasingly looking to short and tightly focused learning to develop future looking skillsets.

Microlearning certifications can also be in soft skills such as teamwork, conflict resolution, presentation skills, customer engagement, problem-solving, and critical thinking. While many of these skills are integrated within existing business courses, it is not always obvious to the employer nor is the student always cognizant about their achievements and accomplishments within this sphere of soft skills. "Ninety-seven percent of employers surveyed said that soft skills were either as important or more important than hard skills." (Janove, 2020) while LinkedIn's 2019 Global Talent Trends survey found that when a new hire does not work out, 89% of the time it is due to a gap in their soft skills.

Badges in specific soft skills help learners to showcase to potential employers that not only do they understand the importance of these skills, but they have achieved mastery in them. Finally, when learners build their confidence in their competencies to be productive employees, they stay in school. Some studies have explored the impact of microlearning on student retention (Roy and Clark, 2019)

AACSB encourages schools and colleges of business to explore a combination of a set of highly sought-after business, technical, and soft skills as a way "to satisfy the requirements of a degree program." In short, the traditional concept of earning a business degree through semester-long in-class lectures for a standard portfolio of courses is fading. This approach requires Deans, Department Chairs, and Curriculum Committees to carefully map their curriculum to the evolving needs of the business workforce and deliver value to their graduates through reputable certifications that establish mastery of valuable skills and competencies.

There are many reasons why accrediting agencies are taking a close look at microlearning as a valid and inexpensive pathway to provide students with a more enriching and timely learning experience. First, micro-learning confronts the growing challenge of declining public support and trust in higher education as a trustworthy and affordable platform that delivers timely, career-based knowledge and life skills with long-lasting value. Microlearning also helps leaders in higher education to be agile and nimble without a huge investment in offering digital badges and credentials that span the breadth of programs the institution offers. More importantly, it helps business schools to stay intensely focused on meeting the talent needs of local and regional employers by preparing their students to build a portfolio of business and technical skills that are highly valued in the marketplace.

AACSB considers microlearning as a valid and valuable learning pathway that emphasizes and highlights the importance of lifelong learning not only from an institutional perspective but also from the tremendous advantages that microlearning can offer learners as they develop their digital identity. Micro-learning showcases student achievements across content knowledge that takes place primarily in the classroom and soft skills and leadership development that may take place through extracurricular activities. AACSBs guidelines encourage institutions to explore and implement a set of high-quality, competency-based, stackable, free-choice learning modules that do not force the learner into a single learning pathway, regardless of their work experiences or career goals. Such an approach can lay the foundation for career readiness that is embedded in the pursuit of lifelong learning, leading to upward mobility (Reid, 2023, Rieder, 2022, Selvaratnam & Sankey, 2022, Sousa-Vieira et. al., 2021).

From a learner's case not only skills, but also drive, ambition, and self-learning may motivate learners to pursue more rigorous and complex subjects. One of the great advantages of micro-learning over semester-long courses is that content or skill development is highly focused and shareable rewards and recognition are delivered in the form of digital badges in a short *period.* For example, some universities offer digital badges for proven mastery of complex topics within a given course, thus encouraging learners to look beyond the course grade and additionally focus on skills valued by employers. Digital badges can be used to promote and encourage student-centric learning. This implies that digital badges can help students to set goals, focus on their individualized learning and accomplishments that clearly shows progress toward their professional goals, share their accomplishments with communities that can impact the student's growth and progress, and build self-confidence in the student to continue to climb the professional ladder (Leong et. al., 2021, McGovern & Gogan, 2022, McGreal & Olcott, 2022, Miller & Jorre, 2022, Perkins & Pryor, 201)

Microlearning can incentivize students to be continuous learners taking consistent and measurable steps to achieve their educational and professional goals and encourage learners to hone their social and emotional skills as well. In other words, learners can reap the benefits of micro-learning by getting the attention of employers. It shifts the attention of employers from GPA as the sole evidence. As mental health issues arise, badges for soft skills and co-curricular activities. Evidence shows that while it connects learners to their curricular journey can drive intrinsic and extrinsic motivation for learners to engage (Reference -34).

According to Facey-Shaw et.al., (2017) badges play an important role within formal and informal learning environments in the following ways:

1. Badges recognize learning and skill development when the badge clearly shows a link to acceptable knowledge norms and industry standards
2. Badges recognize the level of learning achieved – beginner, intermediate-advance
3. Motivates learning by allowing the learner to digitally share their skills with a global community of professionals and employers
4. Helping individuals understand the progression of skills necessary to become an expert in a selected area.

The above goals and objectives are shared by institutions of higher learning as evidence of the value of the education their graduates receive. Hence, badges are no longer something that students pursue outside of the classroom. Instead, they have become central to discussions about remaining on the cutting edge of knowledge delivery, knowledge acquisition, and life-long learning.

Table 2 captures the references to microlearning and lifelong learning in AACSBs guiding principles. The underlying foundation for micro-credentials is a lifelong learning mindset and this fundamental theme is emphasized throughout AACSB's guidelines to business schools and colleges.

Table 1 *AACSB 2020 Guiding Principles and Standards for Business Accreditation: Specific References to "Microlearning"*

The standards envision a wide variety of learners of all ages, participating in the educational experience through several modalities of learning as well as locations. Some learners will seek degree credentials, while others will seek **microlearning credentials**. Lifelong learning will become the norm, and we must consider how quality is assured in courses or modules delivered by AACSB-accredited schools. The standards are designed to be flexible enough to accommodate multiple types of learners, pedagogies, instructional models, and collaborative partnerships, with a continued focus on high-quality outcomes. p. 22.
Standard 5.3: (Assurance of Learning) - **Microlearning credentials** that are "stackable" or otherwise able to be combined into an AACSB-accredited degree program should include processes to ensure high quality and continuous improvement. p. 45.
Microlearning credentials are certifications granted by assessment of mastery of a specialized competency. Such credentials may sometimes be "stackable," or combined to collectively satisfy the requirements of a degree program. Minors, certificates, and badges are common **microlearning credentials**.
5.3 Stackable **Microlearning Credentials** · Credentials such as certificates, minors, and badges that lead to a degree program will be evaluated at the degree program level. p.47.
5.3 Stackable **Microlearning Credentials** · Provide a list of microlearning credentials that may be stacked into a degree and describe how the portfolio of microlearning credentials is aligned with the school's mission and strategy. Explain how these credentials may lead to a degree and describe how quality is assured for these microlearning credentials. p. 48.

Further, AACSB's core principles of effective learning also apply to microlearning in business schools and are summarized as follows:

1. Quality Assurance: Quality is assured by direct assessment of learners (2020 Guiding Principles, p. 47) and should, ideally, include both direct and indirect methods of assessment. Regarding microlearning, direct assessment is necessary to determine how successful learners are in achieving the stated objectives. This is key given the bite-sized and practical nature of microlearning initiatives. The indirect assessment also provides valuable information and allows the college to gauge if learners are becoming more confident with new skills, and it also provides data from community and business leaders regarding the functional usefulness of the micro-learning programming.
2. High-quality outcomes: Objectives or outcomes should be market-driven and learner needs and align with the vision and mission of the institution. Skill requirements are evolving and shifting at a rapid pace and hence, colleges of business must continually measure the pulse of local, regional, and global employers they serve. When the institution's strategic plan is reflective of the ongoing and emerging needs of employers, it can serve as a guidepost on how to leverage the outcomes of microlearning in an impactful and high-quality manner.
3. Continuous Improvement: Skill requirements are constantly evolving and, thus, delivery and content must evolve to match or remain ahead of the industry and learner needs. Continuous improvement requires that outcomes be monitored and adjusted on an ongoing basis. Anything short of this results in outdated programming that repeats the cycle of disenchantment with higher education.
4. Assessment of Mastery: Assessment is necessary to measure and track learning outcomes. Mastery implies knowledge, understanding, and proficient application of current skills. Mastery is short-lived in a dynamic environment unless the development of a lifelong learning mindset is part of the outcome objectives. Comprehensive, cutting-edge, and trustworthy assessments are essential to creating a pipeline of talent that meets the needs of employers and society.
5. Specialized Competency: AACSB is clear that specialized competency is critical. Current and emerging technologies are emphasized in the 2020 Guiding Principles and accredited colleges and programs must emphasize cutting-edge skills development. Standard 4.2 highlights the need to ensure currency, relevancy, and competency. The 2020 standards also state that "Microlearning credentials are certifications granted by assessment of mastery of a specialized competency. (p. 46, 2020 Guiding Principles). AACSB appears to recognize that the evolving nature of skills development creates a space that can be effectively filled by micro-credentials, especially regarding the development of specialized fields.
6. Align with the school's mission and strategy – AACSB has repeatedly emphasized in all its guidelines and principles the importance of being true to one's vision and mission. Microlearning must fit within the arc of the mission and vision of the institution as a pathway to deploy scarce resources requires that are most relevant, meaningful, and beneficial to its constituents.

Table 2 *AACSB 2020 Guiding Principles and Standards for Business Accreditation: Specific References to "Lifelong Learning"*

Lifelong learning will become the norm, and we must consider how quality is assured in courses or modules delivered by AACSB-accredited schools. The standards are designed to be flexible enough to accommodate multiple types of learners, pedagogies, instructional models, and collaborative partnerships, with a continued focus on high-quality outcomes.
High-quality business schools have processes for ensuring that learners will acquire the competencies to achieve successful outcomes in line with the mission of the school and develop a **lifelong learning** mindset to ensure continued success. P. 41.
Standard 4.3 The school's curriculum promotes and fosters innovation, experiential learning, and a **lifelong learning** mindset. Program elements promoting positive societal impact are included within the curriculum. P. 41.
Contents of degree program curricula result from effective curriculum management processes and include relevant competencies that prepare graduates for business careers and foster a **lifelong learning** mindset. P.42
Standard 7.3 Faculty are current in their discipline and pedagogical methods, including teaching diverse perspectives in an inclusive environment. Faculty demonstrate a **lifelong learning** mindset, as supported and promoted by the school.

4. The Future of Microlearning in Business Education

Microlearning is both an opportunity and a risk for institutions of higher learning. It is a disruptive technology and hence, it can, and will trigger, deep-seated change in how educational institutions and employers create, deliver, assess, verify, and reward competencies and skill development in learners and those ready to enter the workforce or in it. Educational institutions are frequently challenged to provide evidence of the currency of competencies. Given the growing pressure on schools and colleges to provide compelling evidence that their students are ready for a fast-changing and technology-driven global workforce, many institutions of higher learning are exploring the value of microlearning, both as independent pathways and as modules embedded within a given course. Earning badges can make learners better engage with mastering the concepts, create stronger intellectual engagement with given tasks or activities, increase motivation to persist and pursue difficult tasks, build a sense of prestige and a feeling of achievement, increase student participation and classroom discussions, and contribute to academic success.

Business schools and colleges have an opportunity to deliver just-in-time, module-based, trustworthy, inexpensive, and ladder-based credentials that supplement a university degree or stand-alone. Transferrable and stackable credentials showcase the skills, experiences, and expertise of a graduate to hiring managers. Digital certificates showcase the student's motivation and perseverance to be a continuous learner as one who is willing to invest time and resources to evolve with the changing times. (Griffiths University, 2019).

The State University of New York offers more than 400 micro-credentials in more than 60 disciplines (suny.edu). The hallmark of SUNYs micro-credentials is its flexibility and broad definition of learning and learners. SUNY micro-credentials are stackable and embedded in the learner's transcripts, thus making it portable across institutions, while being backed with the SUNY brand. Micro-credentials offered by SUNY are available not only to current students but also to alumni and the public. This positions SUNY as a public institution that challenges the perception that an institution primarily serves only its current students. Instead, SUNY has redefined a student as

one who wants to learn and acquire new skills. Learners have access to all the resources available to students, including student services, that ensure the success of the learner. There are multiple learning pathways for a learner to earn a credential, including degree-based courses or experiential learning, or a combination of both, industry certifications, workshops, and/or non-credit coursework delivered in class or online or at an employer's site. (Source: SUNY MMC Task Force Report and Recommendations (saved in Dropbox)

The SUNY micro-credentials task force report identified the benefits of pursuing this pathway to enhance student learning. These include (the Taskforce report):

- Enable campuses to respond to student needs and industry demands more quickly.
- Establish new academic/industry partnerships.
- motivate learners to persist toward academic and career goals; and
- Bridge noncredit and credit-bearing coursework and experiences.

Microlearning can be easily embedded into existing web systems such as learning platforms. One of the eight megatrends listed in the report "Envisioning Pathways to 2030," is the skills gap between what employers need to achieve competitive advantage and the higher education curriculum and learning outcomes. (Source: http://www.studyportals.com/wp-content/uploads/2018/01/Report-Envisioning-Pathways-to-2030-Studyportals-2018.pdf)

There is another compelling reason why business colleges and schools should actively explore and embrace micro-learning: outreach. Corporations, non-profits, professional associations, educational institutions, and government agencies use these knowledge acquisition pathways to motivate and reward employees for showcasing their commitment and motivation, self-learning, and the pursuit of professional excellence by earning advanced credentials, often on their own time. This leads directly to the core foundation of accreditation assessment, namely, "societal impact." In a survey of 114 employers from a cross-section of industries, 60 percent indicated that they would use badges to assess the qualifications of a candidate during the hiring process.

Changes to the business curriculum can be a slow bureaucratic process at many institutions even as high-demand knowledge and skills change at a rapid pace. Employers expect college graduates to be ready and prepared to be productive on the first day on the job. In other words, the "honeymoon" period has shrunk, and employers are not always willing to fill the gaps between university education and workforce skills (Reference 35). There is a slow and steady shift in the costs of on-the-job training and upskilling from employers to individuals. Further, many employers now also issue their badges.

Additionally, professions and students in other disciplines recognize the potential value of microlearning credentials. There are numerous studies related to the use of microlearning in healthcare professions. Researchers highlight that the use of microlearning among healthcare professionals can prove beneficial since it allows complex topics to be broken down into smaller units, thus facilitating critical thinking and clinical reasoning (Chang De Gagne, 2019). Leong et al. (2020) identify the shortening attention span of humans as a key reason to promote microlearning. Microlearning modules are often developed to assure short, but intense engagement with concepts.

Table 3,4 *Coursera Summary Data for Business Courses*

Total Business Enrollment: March 2023	**37.88 million**
Unique Courses	868
Providers	99
Categories	6
Skills	974
Average Course Enrollment	43.5 thousand
Beginner Level	83.3%
Intermediate Level	15.9%
Advanced Level	0.8%

Source: *Gray Associates, Data Extracted April 25, 2023*

Employees can earn badges to enhance their performance in a specific job role or responsibility or to earn the next promotion and move up the ladder. Many technology companies are enthusiastic issuers of digital badges as a pathway to find employees who can be productive on the first day on the job and to meet the talent needs of their clients.

5. Implications for Future Research and Practice

Micro-credentials are not yet universally accepted as a rigorous means for knowledge and skills acquisition, management, and retention. Even as we confront these gaps and "imperfections," micro-credentials (and their sub-units such as digital badges, digital certificates, and so on) are increasing in prominence and value as a pathway to address the talent needs of businesses and governments. There is a need for further research to address the gaps in our understanding of the nature, scope, challenges, issues, and opportunities related to digital badges and to design frameworks to enhance the definition, design, implementation, verification, assessment, and transparency of digital badges.

More empirical research is needed to understand student motivation for self-learning and lifelong learning from micro-credentials and digital badges. Additional guidelines and case studies are needed to capture the processes and methods by which business schools can implement, assess, and integrate micro-learning into existing courses. We must move from anecdotal research on employers' preferences and acceptance of micro-credentials to a rigorous understanding of the bridge between business school curriculum and employee productivity. We need criteria to measure the quality of micro-credentials and methods to ensure quality assurance, transferability, and shelf life. Finally, the ability to integrate, showcase, and capture the deep learning that takes place inside and outside a classroom needs further exploration through standardization across different courses and perhaps even institutions.

This paper integrates the growing importance of digital badges in business education and how it can serve as an implementation tool to meet or exceed AACSBs principles and standards. There is a gap in the literature in addressing how digital badges can play an important role to prepare business students to meet the demands of employers while simultaneously addressing the goals, standards, and principles of AACSB.

6. References

1. Alt D. 'Who benefits from digital badges? Motivational precursors of digital badge usages in higher education,' Current Psychology. 2023, March 42(8):6629-40.
2. Andriotis, N. 'What is Microlearning: A Complete Guide for Beginners,' e-Learning Industry. (https://elearningindustry.com/what-is-microlearning-benefits-best-practices), 2018, December 10, 2018.
3. Arslan Ö, Dennen V, Bong J. 'Engaging Learners with Challenges and Badges: Designing and Evaluating a Microlearning System.' International Journal for Educational Media and Technology. 2022; 16(2):14-24.
4. Bell N, Liu M, Murphy D. A Framework to Implement Academic Digital Badges When Reskilling the IT Workforce. Information Systems Education Journal. 2022, Feb. 20(1):36-46.
5. Brauer S, Korhonen AM. 360-Degree view of digital open badge-driven learning. In Innovations in the Design and Application of Alternative Digital Credentials 2022, 95-130. IGI Global.
6. Brauer S, Korhonen AM. Digital Open badges and e-portfolios in Profiling Expertise. Micro credentials, Macro Learning: One University's Path Toward Unbundling. In New Models of Higher Education: 2022, 313-331. IGI Global.
7. Braxton SN. 'Competency frameworks, alternative credentials and the evolving relationship of higher education and employers in recognizing skills and achievements', The International Journal of Information and Learning Technology. 2023, Feb 10.
8. Brown M, Mhichil MN, Beirne E, Mac Lochlainn C. 'The Global Micro-Credential Landscape: Charting a New Credential Ecology for Lifelong Learning,' Journal of Learning for Development. 2021;8(2):228-54.
9. Carnevale, A. P., Fasules, M. L., & Campbell, K. P. (2020). Workforce basics: The competencies employers want. Georgetown CFIB (Canadian Federation of Independent Business). 2021, May. *Business Barometer* https:// www. cfib- fcei. ca/ sites/ defau
10. De Gagne JC, Park HK, Hall K, Woodward A, Yamane S, Kim SS. Microlearning in Health Professions Education: Scoping Review. JMIR Med Educ. 2019 Jul 23;5(2):e13997. doi: 10.2196/13997. PMID: 31339105; PMCID: PMC6683654.
11. Cumberland DM, Deckard TG, Kahle-Piasecki L, Kerrick SA, Ellinger AD. 'Making sense of the digital badging landscape in education and workplace settings: a scoping review of empirical literature', European Journal of Training and Development. 2023, Jan 11.
12. Dyjur, P., & Lindstrom, G., 'Perceptions and uses of digital badges for professional learning development in higher education.' TechTrends,2017, 61(4), 386–392. https://doi.org/10.1007/s11528-017-0168-2
13. Ezeiza A, Barroso N. "Congratulations! You Have Earned A Badge": How To Engage Students With Gamification And Digital Badges. InINTED2022 Proceedings 2022, 4743-4749.
14. Fanshawe M, Burke K. 'I got a badge!' Using badges to promote student engagement,' ASCILITE TELall Blog. 2022 Jan 1.

15. Facey-Shaw L, Specht M, Van Rosmalen P, Berner D, Bartley-Bryan J., 'Educational functions and design of badge systems: A conceptual literature review. IEEE Transactions on Learning Technologies,' 2017 Nov 14;11(4):536-44.
16. Ghasia, M., Machumu, H. & Smet, E., 'Micro-credentials in higher education institutions: An exploratory study of its place in Tanzania,' International Journal of Education and Development using ICT, 15(1), Open Campus, The University of the West Indies, West Indies.
17. Gibson D, Ostashewski N, Flintoff K, Grant S, Knight E., 'Digital badges in education. Education and Information Technologies,' 2015, June20:403-10.
18. Glassdoor Team, '15 More Companies That No Longer Require a Degree – Apply Now,' November 2021, (https://www.glassdoor.com/blog/no-degree-required/)
19. Gray Associates (www.grayassociates.com)
20. Gregg A, Park J, Fenton C, Lang D, Handley M, 'Exploring the "Why" of Micro-Credentials and Digital Badges: Engineering Students' Motivations for and Perceived Utility of Learning Outside of Class,' IEEE Frontiers in Education Conference (FIE) 2022 Oct 8 (pp. 1-7). IEEE.
21. Janove, J. 'Leaders and Employees Need Soft Skills Now More Than Ever.' Society for Human Resource Managers, a new credential ecology for lifelong learning. *Journal of Learning Development, May 2020)8(2).*
22. Lang G, Sharp JH., 'Micro-Credentials in US Higher Education: An Empirical Analysis,'. Information Systems Education Journal, 2023;21(1).
23. Lauricella S, McArthur FA. Taking a student-centered approach to alternative digital credentials: multiple pathways toward the acquisition of micro credentials. Innovations in the Design and Application of Alternative Digital Credentials 2022 (pp. 57-69). IGI Global.
24. Leong, K., Sung, A., Au, D. and Blanchard, C. (2021), "A review of the trend of microlearning", *Journal of Work-Applied Management*, Vol. 13 No. 1, pp. 88-102. https://doi.org/10.1108/JWAM-10-2020-0044
25. LinkedIn Talent Solutions. (2022). The Reinvention of Company Culture. (https://business.linkedin.com/talent-solutions/global-talent-trends).
26. McCabe, Joe, and Nina Narayanan. "How do Global Organizations Create a Culture of Learning for the Future?" 2019, https://hdl.handle.net/1813/74419
27. McGovern TM, Gogan JL. 'Student, interrupted: can digital badging improve programmatic agility and help students during crises?', Communications of the Association for Information Systems. 2022; 51(1):2.
28. McGreal R, Olcott Jr D, 'A strategic reset: micro-credentials for higher education leaders,' Smart Learning Environments. 2022, Feb 7;9(1):9.
29. Meckler L., 'Public education is facing a crisis of epic proportions. How politics and the pandemic put schools in the line of fire,' The Washington Post. 2022 Jan 30;30.
30. Miller KK and Jorre T. 'Digital micro-credentials in environmental science: an employer perspective on valued evidence of skills,' Teaching in Higher Education. 2022 Mar 23:1-7.
31. Goger A, Parco A, Carter-Rau R, Henderson J, Homma K, Meliksetyan A, Milman N., 'Going Digital: How Learning and Employment Records Shape Access to Quality Education and Jobs,' Center for Universal Education at The Brookings Institution. 2022 Dec.

32. Muchtar FY, Nitaninnawa F. Learning Online: The Effect of Learning Digital Badges on Learning Outcome. In International Conference on Elementary Education 2022 Apr 14 (Vol. 4, No. 1, pp. 505-514).
33. Muilenburg, L. & Berge, B. (Eds.). Digital Badges in Education: Trends, Issues, and Cases.Routledge (2016).
34. Nadworny, Elissa. (January 13, 2022). More than 1 million fewer students are in college. Here's how that impacts the economy. (NPR, Morning Edition). Americans choose jobs over college : NPR
35. Noyes, J. A., Welch, P. M., Johnson, J. W., & Carbonneau, K. J. A systematic review of digital badges in health care education. *Medical Education*, (2020), *54*(7), 600–615. https://doi-org.uscupstate.idm.oclc.org/10.1111/medu.14060
36. O'Connor, E.A. & McQuigge, A. (2013). Exploring badging for peer review, extended learning and evaluation, and reflective/critical feedback, Journal of Educational Technology Systems (42:2), 87-105.
37. Perkins, J., & Pryor, M. (2021). Digital badges: Pinning down employer challenges. Journal of Teaching and Learning for Graduate Employability, 12(1), 24–38.
38. Pew Research Center, The value of a college education on the American worker | Pew Research Center, October 6, 2016.
39. Pichette J, Rizk J, Brumwell S. Making sense of the micro: building an evidence base for Ontario's micro credentials. Journal of Innovation in Polytechnic Education. 2021 Jul 12;3(1):10-4.
40. Qureshi, Z. (February 25, 2020). Technology and the future of growth: Challenges of change. Brookings. (https://www.brookings.edu/blog/up-front/2020/02/25/technology-and-the-future-of-growth-challenges-of-change/)
41. Reed A., 'Micro-credentials and the role of evidence: increasing the potential for learner-centeredness, inclusivity and an expansive model of assessment and credentialing. The International Journal of Information and Learning Technology. 2023, Mar 21.
42. Rogers, E. M. (2003). *Diffusion of innovations*. New York: Free Press.
43. Rieder AT, 'Using micro-credentials and digital badges in education and training: A literature review,' Society for Information Technology & Teacher Education International Conference 2022 Apr 11 (pp. 246-251).
44. Roy S, Clark D, 'Digital badges, do they live up to the hype?,' British Journal of Educational Technology. 2019 Sep; 50(5):2619-36.
45. Selvaratnam, R.M., & Sankey, M.D. (2020). An integrative literature review of the implementation of micro-credentials in higher education: Implications for practice in Australasia. Journal of Teaching and Learning for Gradate Employability, 12(1), p. 1–17)
46. NPR: 'More than 1 million fewer students are in college," https://www.npr.org/2022/01/13/1072529477/more-than-1-million-fewer-students-are-in-college-the-lowest-enrollment-numbers-\
47. Sousa-Vieira M-E, Ferrero-Castro D, López-Ardao J-*C. Design, Development and Use of a Digital Badges System in Higher Education. Applied Sciences. 2022; 12(1):220. https://doi.org/10.3390/app12010220*

48. Sousa-Vieira ME, Ferrero-Castro D, López-Ardao JC, 'Design, development and use of a digital badges system in higher education,' Applied Sciences. 2021 Dec 27;12(1):220.
49. Sousa-Vieira ME, López-Ardao JC, Fernández-Veiga M, Rodríguez-Rubio RF. 'Study of the impact of social learning and gamification methodologies on learning results in higher education,' Computer Applications in Engineering Education. 2023 Jan;31(1):131-53.
50. Supe, Liana, et al. (2018). Factors affecting the competitiveness of a higher education institution: systematic literature overview. Research for Rural Development. Volume 2.
51. West RE, Cheng Z. Digital Credential Evolution. Handbook of Open, Distance and Digital Education. Springer. https://edtechbooks. org/-NJwY. 2022.
52. Wilson, B.G., Gasell, C., Ozyer, A., Scrogan, L. (2016). Adopting digital badges in higher education: scoping the territory. In: Henthal

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