Micro-credentials & Digital Badges: Definitions, Affordances and Design Considerations for Application in Higher Education Institutions.

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Abstract.

While Higher Education Institutes have traditionally viewed awards as a result of ECTS (European Credit Transfer System) credit accumulation, in recent years the recognition of smaller parcels of learning has become popular. Micro-credentials and digital badges are a relatively new concept and lend themselves to a wide variety of educational knowledge, skills and competence achievement, furthermore, they could help certify the outcomes of small, tailored learning experiences. While they are usually regarded as distinct from ECTS credits, some universities have also formalized a connection between the two. They can be used in a variety of settings and offer a flexible and reliable means of capturing continuous professional development. This article considers the development of micro-credentials examining their potential and scope while proposing a distinction between the former and digital badges. The article presents several design models for micro-credentials and digital badges including examples of use in practice toward measurable and achievable learning outcomes. Examining the scope and path to realizing micro-credentials, taking into consideration the European Commission's recommendations on micro-credentials, this article aims to inform best practice for micro-credential design and digital badge design.

Keywords: Design; Digital badge; Instructional design; Learning technology; Micro-credential.

1. Introduction.

1.1 The Context and Consensus.

Micro-credentials and digital badges have emerged in the (primarily) online domain to recognize and communicate achievement in a variety of learning domains, covering both formal and informal learning contexts. At South East Technological University (SETU) significant research is ongoing on the affordances of such awards in Higher Education. The authors here undertook a desk review of the terminology and of several design models for micro-credentials and digital badges. Within the context of small parcels of learning, the term '*digital badge*' is present in the educational lexicon, and providers such as the National Forum of Teaching and Learning in Higher Education chose to label their short online courses as a '*digital badges*'. Several HEIs, such as Trinity College Dublin, Dublin City University and University College Cork, however, offer similar short online courses which they refer to as micro-credentials as such the terms micro-credential and digital badge are being used interchangeably within the broader Irish educational landscape. However, the European Commission (EC) in its 2020 report on Micro-credentials (European Commission, 2020) highlighted the lack of clarity surrounding micro-credentials and digital badges and thus has attempted to standardize these awards.

Covid-19 has provided the impetus for the rapid implementation of micro-credentials by governments in several jurisdictions (Wheelehan & Moodie, 2021) while international government organizations such as UNESCO and the OECD are increasingly focusing on micro-credentials (Kato, Galan-Muros & Weko, 2020; Chakroun & Keevy, 2018). The European Commission formed a Consortium which launched a Common Micro Credential Framework '…*to create portable credentials for lifelong long learners*' (Konings, 2019, p.1). Chakroun & Keevy (2018) highlight the need for a "*common international approach where all aspects of a person's learning are electronically documented, authenticated and can be accessed at anytime and anywhere, shared and amended by the owner or by an authorized party*". (p.7).

> *"The development of micro-credentials to the point where they are being included in national policy frameworks such as qualifications frameworks shows that these international policy flows are now embedded within national contexts". (Wheelehan & Moodie, 2021, p.213).*

At the time of writing while EC recommendations have been issued, no consensus currently exists on the term '*micro-credential*'. Furthermore, several other terms are habitually used in

association with the term including (but not limited to): digital badges, alternative credentials, digital credentials, nanodegrees, digital certificates, micro-masters, and short online courses. Moreover, from an international perspective, the definition of micro-credentials is open to interpretation. As a result, the term '*micro-credential*' has been used to describe all manner of shorter forms of learning experiences irrespective of type, mode and size (Beirne, Nic Giolla Mhichíl & Brown, 2020).

According to Beirne et al. (2020) attempts at developing a definition are confounded using contradictory typologies and synonyms. As touched upon, a recurring issue is the correlation between the terms '*micro-credential*' and '*digital badge*'. The term '*micro-credential*' has also become synonymous with certificates of assessed learning earned through, for example, MOOC structures, however, at present, many MOOC platform providers employ their own labels, such as MicroMasters (edX), Nanodegree (Udacity) and Specialisation (Coursera).

The relationship between digital badges' and micro-credentials remains under scrutiny (Kato et al., 2020) while the European Commission Consultation Group actively worked to address this problem and produced the following working definition in 2020.

> *"A micro-credential is a proof of the learning outcomes that a learner has acquired following a short learning experience. These learning outcomes have been assessed against transparent standards. The proof is contained in a certified document that lists the name of the holder, the achieved learning outcomes, the assessment method, the awarding body and, where applicable, the qualifications framework level and the credits gained. Micro-credentials are owned by the learner, can be shared, are portable and may be combined into larger credentials or qualifications. They are under pinned by quality assurance following agreed standards". (European Commission 2020).*

Despite their increasing use, as mentioned, there exists no common definition of, or standards for, micro-credential use in Europe which can have a limiting effect on the understanding and uptake of micro-credentials, and therefore undermines the potential of micro-credentials to facilitate flexible learning and career pathways (European Commission, 2021). Following another period of consultation, the European Commission released their updated recommendation in May of 2022.

> *"'Micro-credential' means the record of the learning outcomes that a learner has acquired*

> *following a small volume of learning. These learning outcomes will have been assessed against transparent and clearly defined criteria. Learning experiences leading to micro-credentials are designed to provide the learner with specific knowledge, skills and competences that respond to societal, personal, cultural or labour market needs. Micro-credentials are owned by the learner, can be shared and are portable. They may be stand-alone or combined into larger credentials. They are underpinned by quality assurance following agreed standards in the relevant sector or area of activity" (European Commission, 2022)*

While there is no reference to medium of instruction in which micro-credentials exist, a large proportion can be delivered fully online and many Irish HEIs currently offer fully online micro-credentials.

2. Digital Badges and Micro-credentials.

Similar to micro-credentials, a digital badge's defining feature is that it is available primarily online and contains meta-data required to explain its context and meaning. They are currently implemented as short learning outcomes to convey skills acquisition and academic achievement with more transparency (Anderson & Staub, 2015). In essence, digital badges provide three things: motivation, status recognition and evidence of achievement (Gibson et al, 2013). A key advantage of digital badges is that they incorporate the data associated with the award, can be time bound and easily transferred to professional networks and job applications (O'Brien, 2019). With rapid advancements and developments in Smart technologies, Internet of Things (IoT), 5G, and AIs, the development of small skills packages delivered online in accessible formats is becoming rapidly more attractive. The prevalence of these awards is accentuated by social media, where credentials are routinely shared, advertised and celebrated. This increases the reach and engagement with the awarders, providing greater impetus for continuous and open-ended learning opportunities, which are aligned to the awarder's ethos and/or professional context. As is commonly the case, the learning is delivered and assessed online, with focussed learning outcomes aligned to specific tasks. Much recent research attests to the growing interest in small parcels of learning, and the appeal, particularly for adult learners, for shorter, more informal education such as microlearning (Bannister, Neve & Kolanko, 2020).

> *"There has been an observed change among adult learners in preferred learning habits. Social, economic, and technological developments over the last decade have led to a*

> *preference for smaller, incremental educational interactions (e.g., 5–15 minutes in length) rather than the traditional format of longer formal educational activities". (Bannister et al., 2020, p. 43).*

These learning parcels typically have a flexible structure that allows learners to explore topics at their own pace. Targeted specific learning experiences which can offer solutions to complex work problems are a valuable addition to the learning landscape as these pieces of learning can address deficits in workplace skills (Ruddy & Ponte, 2019). Much recent research points to the need for new graduates to develop a set of skills beyond discipline-related baseline ones (Chetwynd, Aiken, & Jefferis, 2018) such as the ability to deal with complex interdependencies, combining information from several sources and linking theory and practice (Huber, Hutchings, & Gale, 2005; De Rodanas et al., 2020). Furthermore, professional practice requires knowledge that can be put to work immediately (Biggs, 1999). Micro-credentials and digital badges offer scope for short term learning and immediate practice which might support the complex workplace deficiencies.

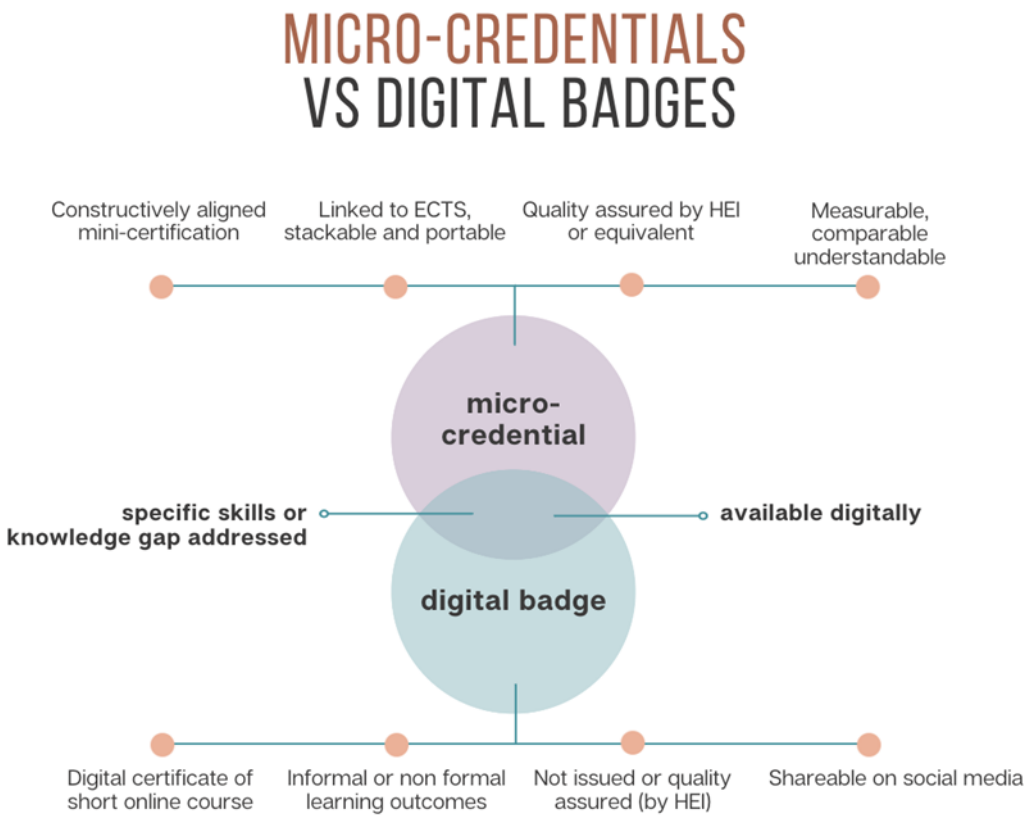
This paper suggests some relevant design principles and considerations for the roll out of both micro-credentials and digital badges. It aims to promote the scholarship of teaching and learning by highlighting key issues in their design process. This topic is approached theoretically from a Learning Sciences and Information Sciences standpoint, offering some initial observations of the challenges and affordances of these awards.

2.1 Distinction between Micro-credentials and Digital Badges.

For the purposes of this paper, the authors advance the following dichotomy for micro-credentials and digital badges. In the broadest sense, a micro-credential can be seen as a mini-certification. In line with the European Commission's (2021) recommended definition, they are usually short, and relatively low-cost courses that have a specific focus on demonstrating proficiency in a particular skill. In terms of quality, the European Commission recommends that micro-credentials be subject to internal and external quality assurance by the system producing them and that the quality assurance processes must be fit-for-purpose, be explicitly documented and accessible and satisfy the needs and expectations of learners and stakeholders (European Commission, 2021). In addition, the European Commission (2021) recommends that micro-credentials be measurable, comparable and understandable containing clear information on learning outcomes, workload, content, level, and the learning offer, as relevant.

Digital badges, on the other hand, can been seen as having dual roles i) they can be viewed as the visual representation of a micro-credential outcome and ii) they can be used to describe short informal and non-formal learning outcomes which are not linked to formal accreditation or ECTS nor are they quality assured by a HEI. As such, digital badges do not undergo quality assurance to the same degree as micro-credentials. This dichotomy is illustrated in figure 1 below.

Figure 1: Micro-credentials vs digital badges.



2.2 Skills and Learning Processes.

Micro-credentials and digital badges typically "*reflect demonstrated skills through a performance of a complex task*" (Anderson & Straub, 2015, p.231) as opposed to traditional recitations of knowledge. They can also encourage meta-cognition as students focus on intrapersonal and interpersonal development. Furthermore, as visual symbols, they are powerful vehicles for conveying shared meaning, contributing to a comprehensive visual narrative of academic

development and accomplishment (Anderson & Straub, 2015). Learners are encouraged to share their badges over social networks, e-mail, and websites, and the information that the awards contain circulates readily in these spaces (Casilli & Hickey, 2016).

Micro-credentials and digital badges have a highly specified nature, based on either a particular set of applicable skills, or the completion of specific complex tasks. They operate to clearly align learning outcomes with tasks so that the credential is measurable and discrete. Based on the work of John Biggs (1999, 2011) curriculum alignment is an approach which offers constructive coherence between teaching, learning, and assessment. Through conscious mapping activities, the course designer uses constructive alignment to optimize student learning and match intended learning objectives with actual learning outcomes through meaningful activities as such they function as a clear representation of a skill set, and so the learning activities associated with it are closely aligned to specific skills.

From a desk review of the micro-credentials and digital badges on offer in the Irish Higher Education landscape, it appears that those delivered in Ireland are all linked to a form of problem-based learning, in that they are focussed on discrete achievable solutions to working or learning problems. The appeal of these easily available, low-cost credentials is inclusivity; such awards are potentially available to large and hard-to-reach populations.

However, as Bannister et al. (2020) observe, though there are opportunities to capitalize on the preference for engaging in these small parcels of learning, and furthermore, there are core considerations which must be addressed. We suggest here that the growing prevalence of these awards calls for a critical evaluation of their features and a deep consideration of their design.

3. Design Process.

Micro-credentials and digital badges are, by their nature, short in duration and can be delivered online where learners can access the course asynchronously, anytime and at their own pace. Micro-credentials can be stacked towards larger units of competence or capability, be verified, secure and shareable with peers, employers and educational providers. As mentioned, they normally certify achievement at a more granular, sub-course level and differ from traditional long-form credentials such as degrees and diplomas in that they are shorter, can be personalised and provide distinctive just-in-time value. Due to their being of a shorter duration and being able to be delivered online this can at times give the impression that content is merely uploaded to a learning management system (LMS) or equivalent without extensive design and

planning or that those documents and folders are created without any specific considerations. However, these courses need to be engaging for the learner, facilitate ease of access, have distinct outcomes and be intentionally designed. In addition, interest in micro-credentials has also been driven by industry and external stakeholders forecasting the need for rejuvenated workforces as society becomes more digitized. This necessitates more than placing documents on a LMS and allowing the learners to navigate to it by themselves. Rather, micro-credentials and digital badges should go through an intentional and considered design process to enhance the learning experience for the learner irrespective of whether they are credit bearing or not. The instructional design and content creation must be cognisant of on an evidence-based design process.

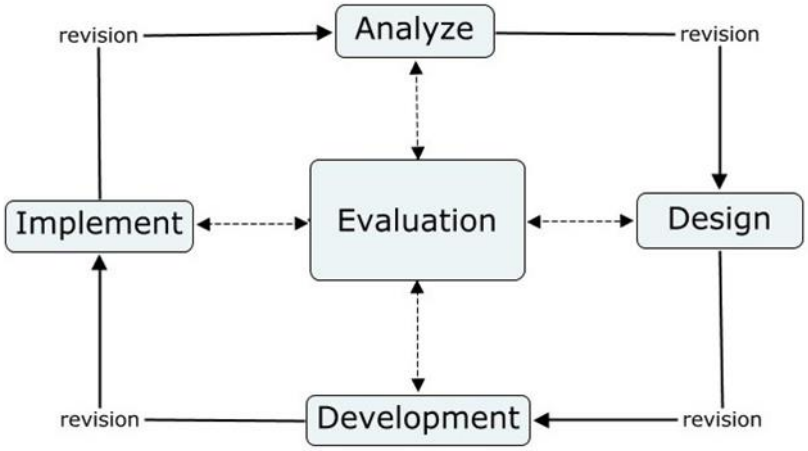
When designing a micro-credential or digital badge, a key decision is whether to develop them as Open Educational Resources (OERs) or to license content. OERs provide flexibility in that they can be edited, repurposed or generated as "*mashups*," which are blends of purpose-built and open-licence content (Commonwealth of Learning, 2019). The design process may be considered on different levels, the macro-level, where the focus lies on high-level structure of the course and its content, and the micro-level which focuses on the design principles to enable the design of the specific content blocks themselves. There are a wide range of approaches to instructional design that could be applied to the design of micro-credentials Below, three approaches are introduced along with their possible applicability to micro-credential design: ADDIE, one of the oldest frameworks which focuses on reflection and iteration, Carpe Diem which is a collaborative, engaging approach to course design, and ABC Learning, a relatively new framework harnessing high energy collaboration within course design.

3.1 ADDIE.

The seed for most of today's instructional design frameworks, ADDIE, developed in the United States in 1975, is a generic instructional design model that includes an organised process for the purposeful development of educational materials (Shelton & Saltsman, 2006). ADDIE is an acronym for the five design phases involved: analysis, design, development, implementation and evaluation outlined in Figure 2 below by Molenda (2003) which illustrates the interconnectedness between the five phases. The strengths of the ADDIE model lie in its simplicity and the fact that educators can adopt the process to their teaching content to create effective learning modules. The phases set down in ADDIE lend themselves well to the development of online courses and as such can be used in the creation of micro-credentials

and digital badges.

Figure 2. Instructional Design model ADDIE.



During the Analysis phase, the learning developer/ instructional designer identifies the instructional problems, instructional objectives, learning environment, and existing skillsets of the learners (Dick & Carey, 1996). After the analysis phase, performance-based challenges are investigated. The Design phase consists of various steps regarding the learning objectives, evaluation tools, training and exercises, content development, an examination of the subject matter, lesson schedules, and media selection (Shelton & Saltsman, 2006). During the Development phase, content experts collate and refine content working in tandem with learning developers, assessment experts and technical experts to aid in the implementation of the content into the various LMS. Feedback is also collected during this process and some stages of the framework may be revisited thus pointing to the iterative nature of this framework.

A procedure for training the instructors and the learners is developed during the Implementation phase. This training should focus on all aspects of the course including learning outcomes, assessment and mode of delivery. During the final phase, Evaluation, the learning developer/ instructional designer should evaluate each phase (employing both formative and summative methods) to ensure that the objectives are achieved by the instructional design and material (ISFET, 2021). Formative evaluation is the internal evaluation conducted at every stage of the ADDIE model to assess the team's continued progress and to revise ongoing project processes while summative evaluation takes place after the Implementation phase (ISFET, 2021).

3.1.1 Use in Practice.

Californian based micro-credential developer, BloomBoard has developed a digital platform for enabling the targeted CPD of educators via micro-credentials. Micro-credentials on BloomBoard follow the ADDIE instructional design framework whereby each micro-credential is based on a robust, standardized blueprint, grounded in instructional design best practices (BloomBoard, 2022). The use of the ADDIE framework enabled BloomBoard to design targeted micro-credentials which are robust and constructively aligned.

Irish learning solutions provider, The Learning Rooms, also utilises ADDIE in its development of instructionally designed courses. Using this model, it has been shortlisted for two national training awards (The Learning Rooms, 2022).

From an academic perspective, Nichols Hess and Greer (2016) examined how they implemented ADDIE to develop an iteration of an accredited Information Literacy online course which, though not labelled a micro-credential perhaps due to the term not being as prominent in the academic lexicon, bears many resemblances to what the European Commission deems a micro-credential (see definition above). The authors employed the phases of analysis, design, development, implementation, and evaluation to integrate current e-learning best practices to increase student engagement (Nichols Hess & Greer, 2016). The authors conclude that employing a systematic approach in the design and evaluation process afforded blueprint for the development process that lent clarity and a strategic focus throughout.

3.2 Carpe Diem.

The Carpe Diem learning design process has been researched and developed over fourteen years by Professor Gilly Salmon, to enable academics to work in small multi-professional collaborative teams to embrace forward-looking learning design in a fast and effective manner and appreciate the benefits of designing for learning. According to Salmon (2014), Carpe Diem was developed to boost the implementation of learning technologies in teaching; and to secure appropriate support for sustainable and innovative change in teaching practices (Salmon, 2014). The Carpe Diem approach is broken up into six steps which involve collaboration among subject matter experts (SMEs) and instructional designers (IDs).

Table 1: Carpe Diem Approach.

Blueprint	SMEs and IDs work together to lay out the essential aspects of what they aim to achieve. This output is agreed in a mission statement.
Storyboard	Collaboratively the process of your learning, teaching and assessment is drawn out in a visual way, working out a schedule, a sense of flow and alignment between the components.
Build Prototype	IDs build the design in the online environment, and create some real practical testable activities.
Reality Check	Colleagues act as '*reality checkers*', to provide productive feedback by engaging in beta testing.
Review & Adjust	Any adjustments can be made, and a plan is developed for the additional work that is needed. The Action Plan is developed from this point considering the results of the beta test.
Planning next steps	The team implements the course based upon the Action Plan.

The strength of the Carpe Diem approach lies in its collaborative approach to course design and as such aligns well with developing short courses such as micro-credentials and digital badges where SMEs and IDs work in tandem.

3.2.1 Use in Practice.

Recent implementation of the Carpe Diem model for the design of micro-credentials on a collaborative European project include the development of six micro-credentials for the European Basic Skills Network Capacity Building Series across six European partner organisations (Bolger, Murphy & Wylie, 2021). The aim of the project is to support European policymakers and stakeholders involved in implementing the European Commission's Upskilling Pathways recommendations. These micro-credentials have been piloted across three European countries and are due to be released under Creative Commons licenses in spring 2023. The Carpe Diem approach was chosen as the learning design framework due to its structured, collaborative approach allowing the ID to work with SMEs across several geographically diverse locations. Each phase of the model was adhered to in the development states of the micro-credentials, however, some challenges emerged which merit mention. Typically, in developing short courses such as micro-credentials or MOOCs, the course developers will have a keen understanding of the target audience. In the Carpe Diem approach, identifying the target audience or persona, take place in the Blueprinting stage. In the above project, the persona differed from nation to nation so that identifying one overarching person through which to filter the content proved to be difficult. This problem was surmounted by hosting bi-weekly micro-

credential workshops where content experts from the partner countries met with the lead content developer to explore commonalities in the personas of each country, thus allowing for a more holistic person to be created to aid in content development. Overall, the Carpe Diem approach enabled effective cross-collaboration and according to the pilot evaluation data produced highly rated micro-credentials.

3.3 ABC Learning Design.

The ABC (Arena Blended Curriculum) Learning Design developed by Clive Young and Nataša Perović in 2014 continues to grow in popularity globally (Gormely & Stone, 2019). Based on Laurillard's (2012) notion of six '*learning types*', derived from her theory-based Conversational Framework the method provides an accessible, high-energy curriculum development workshop where participants work purposefully in teams to design or redesign modules. Participants leave the workshop with a storyboard detailing the intended student learning experience they seek to establish via engaging in a combination of utilising learning type cards, structured activities, discussions and debates (Gormley & Stone, 2019). Participants also develop their awareness of potential digital technologies and are frequently provided with follow-up supports to help make their designs a reality.

ABC Learning Design, currently implemented in several Higher Education Institutes in Ireland such as in Dublin City University and University of Limerick, builds on the '*six learning types*' concept from Diana Laurillard's model of how students learn, '*Conversational Framework*', described in Teaching as a Design Science (2012). This model bears similarities to Gilly Salmon's Carpe Diem method of online course design in that both methods emphasise the collaborative approach to course design. Similar to Carpe Diem, ABC Learning Design organises course development around active workshops where the stages of the method are worked on collaboratively and is such provides a course design framework suited to the design of micro-credentials. ABC Learning Design workshops, normally lasting ninety minutes to two hours, entail a consistent sequence of activities including (Gormley & Stone, 2019): Introductory presentation to set the scene for participants followed by a '*Tweet*' exercise to help distil the core purpose or essence of the course. A Storyboarding activity takes place using six '*Learning Types*' cards to map out the intended student learning experience before delving into the assessment to illustrate formative and summative assessment points. An important element of the workshop is to produce an action plan to identify next steps such as further follow up technology support.

3.3.1 Use in Practice.

ABC Learning Design is growing in popularity driven in part by the Erasmus+ project '*ABC to VLE*' lead by UCL including a European consortium of 12 universities of which DCU was a member. The primary project output produced a learning design and staff development toolkit which is a '*pack*' of seven guides with accompanying resources. The seven short guides, presented as an online resource, provide a cohesive narrative thread linking the various components of ABC LD method. The real value in the Toolkit however is the resource collection; tools, examples, variations and evaluations produced during the project and via the wider ABC LD community. These resources are linked from the Guides to enable those interested in the method to '*dive deeper*' at any point into specific resources, examples and ideas. The project also produced 25 case studies of the implementation of ABC to VLE rapid learning design methodology across 13 institutions, many of which used this framework to develop micro-credential type courses, for example, the Vives University of Applied Sciences 3 ECTS course on research and writing skills, the KU Leuven MOOC Sustainable Food Processing delivered via edX and DCU's Online Teaching Course for Open Education Teachers which was delivered fully online over a period of two weeks and was aligned to half of an ECTS. All of the above examples were instructionally designed in a collaborative way with clear and achievable learning outcomes following quality assurance procedures.

4. Design at the Micro Level.

We have discussed, at the macro level, some models to help inform the overarching structure and curriculum of micro-credentials. We now proceed to consider the requirements at the micro level, the design of the content. When designing digital content, e-learning or multimedia content for online learning – as is the case for micro-credentials – an especially important starting point is the knowledge and awareness of e-Learning's unique characteristics. Clark and Mayers' seminal text, e-Learning and the Science of Instruction (2016) provides a useful guide to evidence-based e-learning design, providing a research-based framework. This work describes the guidelines, psychology and applications to improve the learning experience, including 12 principles to enable the designer / developer to adopt best practices for communicating information effectively and provides evidence-based techniques to engage learners.

Such a focus on process necessarily links with a specific outcome or skill being acquired by the learner, so that the instructor provides "*a short engagement in an activity intentionally designed*

to elicit a specific outcome from the participant." (Kapp & Defelice, 2019, p.11) In microlearning, each unit or each piece of content is intentionally designed, self-contained, brief, and has a clear outcome to help the learner's performance.

Duarte (2008) suggests that a key design philosophy is arranging elements, and particular arrangements can tell a story. This can be distilled into a simple concept; "*it is laziness on the presenter's part to put everything on one slide*" (Duarte, 2008, n. p.). The curriculum design of any microlearning must be cognisant of design principles and their importance. To create effective microlearning that is engaging and sustained, we must go beyond putting material online- and deeply consider motivational factors as well as engaging relevant tasks.

The number of learners taking micro-credentials and digital badges is on the rise. Learners today have the option to pick and choose from thousands of available online micro-credentials. Well considered design always has the learner in mind and will help to attract and retain learners. Furthermore, good design can enhance the learning experience and can facilitate upskilling across divergent online spaces, platforms and disciplines, thereby actively promoting lifelong learning.

5. Conclusion.

The increased focus on the use of micro-credentials in education illustrates the need for innovative and adaptable recognition of learning. Micro-credentials facilitate students to learn specific skills or gain knowledge in professionally focused areas, and are stackable, supporting flexible progression. Wheelehan & Moodie (2021) have suggested that ideas about human motivation are actively reshaping relations of classification and framing in HE curriculum and that the use of micro credentials reflects a focus on sets of skills in anticipation of labour market requirements. Coupled with this, across Europe there has been a growth in the use of private sector services within the education landscape and public education institutions (Cone & Brøgger 2020). The professional imperative to upskill therefore sits comfortably with recurrent, small, accessible, and progressive qualifications.

Here, we have suggested that the increased focus on such awards must go hand-in-hand with appropriate design considerations. Because these awards represent smaller pockets of learning, and are online, there is a potential assumption that simply putting material online will suffice. There is a danger that the essential design criteria may be overlooked in the planning and rollout of such awards. Rather, micro credentials/digital badges need to go through a

considered and intentional design process.

Such credentials' curriculum and design require a deep focus on both the regulatory protocols and the appropriate elements of instructional design to ensure that micro credentials are quality assured and fit for purpose. Attending to the requirements of regulatory frameworks is also of critical importance as these units of learning must retain transferability across international borders.

We have addressed the attendant design concerns and offered suggestions for instructional design, considering the unique character of these awards. We believe that the future is '*stackable*'; that these awards will see exponential growth, due to participants being encouraged to share their badges over social networks, which enhances the awards' prominence and leads to more enrolments. This article has attempted to illustrate how the affordances of digital badges are transforming and radicalizing how we conceive of academic credentialing, and educational assessment. We believe that microlearning will continue to be a feature of the educational landscape, and we hope to have contributed to an enhanced focus on the quality of these credentials.

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