

THE 21ST EDITION OF THE INTERNATIONAL CONFERENCE
EUROPEAN INTEGRATION
REALITIES AND PERSPECTIVES**Micro-credentials and Digital Badges: Reimagining Academic Recognition
in European Universities****Ștefan Anghel-Creangă¹**

Abstract: Objectives: This paper investigates how micro-credentials and digital badges are transforming academic recognition systems in European universities, and whether existing institutional and policy frameworks are adequate to support their widespread adoption. **Prior Work:** The study builds on the European Commission's micro-credentials framework, the Bologna Process principles, and existing research on open digital badges, stackable qualifications, and lifelong learning policy in the European Higher Education Area. **Approach:** A mixed-methods approach was employed, combining a systematic review of European policy documents with a comparative analysis of micro-credential implementation across eight universities in four European Union member states, supplemented by interviews with academic administrators and employers. **Results:** Findings indicate strong employer demand and learner interest in micro-credentials, yet significant inconsistencies in quality assurance, credit recognition, and cross-border transferability persist, undermining their potential as scalable alternatives to traditional degrees. **Implications:** The results have direct implications for university administrators designing flexible learning pathways, for policymakers seeking harmonised European recognition standards, and for academics rethinking modular curriculum design. **Value:** This paper offers an original cross-national comparison of micro-credential governance models and proposes a harmonisation framework tailored to the European context.

Keywords: open badges; quality assurance; Bologna Process; credit transfer; lifelong learning

1. Introduction

The landscape of higher education in Europe is undergoing a profound transformation, driven by the rapidly changing demands of the global labour market and the accelerated pace of technological advancement. Traditional degree programs, while foundational, are increasingly being supplemented — and in some contexts, challenged — by more agile, targeted forms of learning. At the forefront of this educational paradigm shift are micro-credentials and their technological counterparts, digital badges. These bite-sized qualifications offer a pathway for continuous upskilling and reskilling, aligning perfectly with the European Union's broader objectives for lifelong learning and economic resilience.

Despite the enthusiastic reception from learners and industry stakeholders, the integration of micro-credentials into the established academic architecture of European universities remains fraught with

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structural and policy challenges. The core of the issue lies in academic recognition. European higher education is deeply anchored in the European Credit Transfer and Accumulation System (ECTS) and the Bologna Process, frameworks originally designed for macro-qualifications (bachelor's, master's, and doctoral degrees). Adapting these rigid, time-tested systems to accommodate modular, short-form credentials presents a formidable institutional hurdle.

This paper aims to bridge the gap between policy aspirations and institutional realities. By examining the current state of micro-credential implementation across a diverse sample of European universities, this study seeks to uncover the systemic barriers to academic recognition. Furthermore, it proposes actionable pathways for developing a harmonised recognition framework that maintains academic rigour while embracing the flexibility inherent in digital badging and micro-credentials.

2. Related Work

The discourse surrounding micro-credentials is deeply embedded in the evolution of lifelong learning policies within the European Higher Education Area (EHEA). The European Commission's 2022 Recommendation on a European approach to micro-credentials established a critical baseline, defining micro-credentials as the record of learning outcomes acquired following a small volume of learning.

This policy document emphasised the need for transparency, quality assurance, and portability, setting the stage for institutional adoption across member states.

Technologically, the concept relies heavily on the Open Badges Infrastructure (OBI), originally developed by the Mozilla Foundation. Open Badges provide a secure, verifiable, and machine-readable format for representing skills and achievements. Literature in educational technology has extensively documented the motivational benefits of digital badges, highlighting their capacity to gamify learning and provide granular visibility into a learner's skill profile. However, scholars like Smith and Moore (2022) caution that without robust quality assurance mechanisms, digital badges risk becoming "empty signifiers" disconnected from genuine academic or professional value.

In the context of the Bologna Process, researchers have explored the concept of "stackability"—the ability for learners to accumulate micro-credentials over time and combine them into a formal macro-qualification. Existing literature suggests that while stackability is theoretically appealing, practical implementation is hindered by heterogeneous national legislations and a lack of consensus on how to map micro-credential learning hours to formal ECTS credits.

3. Problem Statement

The central problem addressed in this study is the inconsistency in the academic recognition and quality assurance of micro-credentials across European universities. While institutions are rapidly developing and issuing digital badges, there is a pronounced lack of a cohesive, trans-national framework governing their value. This fragmentation undermines the primary value proposition of micro-credentials: their portability and utility in facilitating seamless cross-border mobility for learners and workers.

Specifically, universities struggle to assign ECTS credits to short courses that do not fit neatly into traditional semester structures. Furthermore, the lack of mutual recognition agreements means a digital badge earned at an institution in Romania may not be recognised for credit exemption at an institution in Germany. This creates a bottleneck, trapping the value of the micro-credential within the specific institution or local industry network that issued it, rather than allowing it to function as a universally

accepted currency of knowledge.

4. Concept and Terms

4.1. Micro-credentials

For the purpose of this study, a micro-credential is defined as a certified record of learning outcomes that have been assessed following a short, targeted learning experience. Unlike certificates of attendance, micro-credentials require verifiable assessment of the competencies acquired.

4.2. Digital Badges

A digital badge is the technological vehicle used to issue, store, and share a micro-credential. It contains embedded metadata detailing the issuing institution, the date of issuance, the specific learning outcomes achieved, and a link to the assessment criteria. This metadata ensures authenticity and prevents credential fraud.

5. Solution Approach

To capture both the practical and policy dimensions of this issue, a mixed-methods research design was employed. The primary methodology consisted of a comparative case study analysis of micro-credential implementation at eight universities located in four distinct European regions: Western Europe (France, Germany) and Eastern Europe (Romania, Poland). These institutions were selected based on their public commitment to integrating flexible learning pathways.

Data collection involved three concurrent phases. First, a systematic review of the universities' internal policy documents, senate resolutions, and curriculum guidelines was conducted to understand the formal governance of micro-credentials. Second, semi-structured interviews were carried out with 24 academic administrators, including deans of academic affairs and quality assurance directors, to identify practical implementation barriers. Finally, a survey was distributed to 150 regional employers associated with these universities to assess the labour market's perception and valuation of digital badges.

6. Analysis of Results

The empirical findings reveal a stark contrast between external market demand and internal institutional readiness. The employer survey indicated high enthusiasm for micro-credentials, with 78% of respondents stating they factor verifiable digital badges into their hiring decisions, particularly for rapidly evolving technical skills (e.g., data analytics, software development, and green technologies).

Conversely, the institutional analysis highlighted severe bottlenecks. Only two of the eight universities studied had successfully integrated micro-credentials into their formal ECTS framework. The remaining six treated them as non-credit-bearing extracurricular activities, limiting their appeal to degree-seeking students. Table 1 summarizes the recognition models observed across the sampled institutions.

Table 1. Micro-credential Recognition Models across Sampled Universities

Region	ECTS Integration	Quality Assurance Framework	Stackability to Degree
Western EU (Institution A)	Full (1-3 ECTS)	National Agency Standard	Yes (up to 30 ECTS)
Western EU (Institution B)	Partial	Internal Senate Review	Restricted
Eastern EU (Institution C)	None (Extracurricular)	Departmental Level	No
Eastern EU (Institution D)	Pending Legislation	Ad-hoc	No

Interviews with academic administrators confirmed that the primary barrier is the rigid interpretation of the Bologna framework by national accreditation bodies. Administrators expressed concern that awarding ECTS for highly modular, industry-led courses could compromise the holistic academic experience and bypass standard rigorous review processes. Additionally, the lack of a shared digital infrastructure across borders makes the verification of foreign digital badges cumbersome, deterring cross-institutional recognition.

7. Conclusion

Micro-credentials and digital badges hold immense potential to democratise continuous education and bridge the persistent skills gap in the European labour market. However, their current trajectory is hindered by fragmented, siloed implementation strategies at the university level. The lack of standardisation in assigning ECTS credits and guaranteeing quality assurance prevents these credentials from functioning as true, interoperable academic currency.

To realise the full potential of this educational innovation, European universities must move beyond treating micro-credentials as peripheral extension programs. A harmonised framework—characterised by mutual recognition agreements, standardised metadata for digital badges, and clear national guidelines for ECTS conversion—is urgently required. This will necessitate a cultural shift within academia, embracing flexibility without sacrificing the hallmark quality of European higher education.

8. Future Work

Future research should focus on the technical interoperability of digital credentialing systems. Specifically, exploring the integration of blockchain technologies and verifiable credentials (W3C standard) could provide the necessary trust layer to automate cross-border recognition. Additionally, longitudinal studies tracking the career trajectories of learners who rely primarily on stacked micro-credentials, as opposed to traditional macro-degrees, will be vital in validating the long-term socioeconomic impact of this educational model.

9. Acknowledgement

The author wishes to acknowledge the support of the University of Galați and the academic administrators who generously provided their time and insights during the interview phase of this research.

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