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Persone, Educazione e Welfare nella società 5.0

Community Notebook. People, Education and Welfare in the Society 5.0

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QUADERNI DI COMUNITÀ

WORKSHOP PROCEEDINGS

EMPOWERING CHANGE:

Navigating Twin Transitions and Enhancing Civic
Engagement in Higher Education

Edited by Stefania Capogna and Maria Chiara De Angelis

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11. MICRO-CREDENTIALS AND THE DIGITAL TRANSFORMATION OF HIGHER EDUCATION

by Sergio Pappagallo*

Abstract: Through micro-credentials and open badges, education transcends rigid monoliths, evolving into a dynamic mosaic of granular competencies certified. This represents a digital revolution championed by the European Union to foster lifelong learning and employability (Council of the European Union, 2022). This study delves into how these tools, grounded in constructivist principles, democratize education by empowering learners as active architects of knowledge, with badges validating real-world experiences and personalized pathways (Gibson *et al.*, 2015: 403). The objective of this exploratory study is to balance anticipated benefits—such as equity and flexibility—with sociological risks, hypothesizing that, in stratified contexts, micro-credentials may amplify inequalities by reducing human essence to quantifiable skill units (Wheelahan & Moodie, 2021). What is the intrinsic value of micro-credentials and open badges? How do they navigate digital and regional divides? Employing documentary analysis of EU policies, Eurostat statistics, and institutional reports (EUA Trends 2024), the article adopts sociological lens, critiquing neoliberal commodification (Bourdieu, 1986). Future endeavors might incorporate stakeholder interviews and longitudinal studies to map impacts from a qualitative point of view, advancing inclusive policies.

Keywords: Micro-credentials, Digital badges, Equity, Commodification, Digital divide.

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Introduction

Micro-credentials and open badges are rapidly transforming the landscape of higher education, promising to make skills and learning more transparent, flexible, and relevant in a changing world. Advocated at the highest levels of European policy, these digital certifications are hailed as tools for lifelong learning, labour market adaptation, and personal empowerment. Yet beneath these promises lies a complex reality: do micro-credentials truly democratize access and foster equity, or do they risk intensifying existing social and digital divides? How do new forms of recognition reshape the meaning of knowledge, participation, and merit in the university and beyond?

This study critically explores the hopes and contradictions at the heart of Europe's digital credential revolution, inviting readers to question whether innovation alone can deliver a more just and inclusive educational future.

1. Methodology

This study employs a documentary analysis, drawing on a cross-section of policy documents, peer-reviewed academic literature, and official statistical reports published over the last decade. Sources were identified through searches in recognized databases (JSTOR, Taylor & Francis, Springer, etc.) and were included if they addressed micro-credentials or digital badges and provided empirical or analytical depth. Policy documents from the European Union, the European University Association, OECD, and Eurostat further contextualize trends and disparities. The scope of the article is to explore the opportunities and the criticalities, therefore the methodology relies mostly on secondary sources and

the article remains limited by the availability of primary quantitative surveys and direct interviews, highlighting an area for future research expansion.

2. Micro-Credentials and Digital badges Theoretical Framework: Opportunities and Challenges

In the context of the triple transition—digital, green, and demographic—the profile of adult learners is increasingly fragmented, shaped by a mosaic of lived experiences rather than uniform pathways. Micro-credentials represent a paradigmatic shift towards democratizing education and empowering the individual within the vast landscape of digital transformation. Rooted in constructivist theory, these granular badges serve as concrete validations of knowledge co-constructed through diverse experiences, moving beyond static hierarchies of content acquisition towards fostering agency and lifelong learning (Gibson *et al.*, 2015).

Institutional frameworks, particularly those championed by the EU Commission, have underscored the promise of micro-credentials and open badges to bridge the gap between formal education and real-world applicability (Council of the European Union, 2022; Haughton & Singh, 2019). Furthermore, the evolution in recent employer surveys stands as an evidence that the policies are well aligned with social needs. In 2019, there was widespread unfamiliarity, with 97% of employers unaware of digital badges; by 2024, as Kahle-Piasecki *et al.* (2024: 18) demonstrate, there was not only greater awareness but optimism about the potential of micro-credentials to promote inclusive validation in labour markets.

Thus, drawing on Dewey's vision of education as a vehicle for social reconstruction (Dewey, 1916), the micro-credential paradigm signals a profound epistemological and ethical

reconfiguration. Here, the cultivation of individual capabilities is reframed as a collective good accessible to all, not a privilege for an elite. This positions micro-credentials and open badges as pivotal tools for aligning lifelong learning with the dynamic demands of both labour markets and learner-centred pedagogies. To this end, the meta-data-rich architecture of open badges provides guarantees of traceability, verifiability, and portability, operationalized through robust international standards (IMS Global, 2021; Mozilla Foundation & IMS Global, 2021). Such standardization not only enables transparent recognition but strengthens the interoperability and perceived reliability of micro-credentials across educational and professional settings.

It is also noteworthy to acknowledge the profound transformation and impact that micro-credentials might have from a pedagogical point of view. Pedagogically, micro-credentials catalyze a transformation from rote transmission to learner self-actualization, elevating individuals from passive recipients to architects of their own meaning. This paradigm shift also draws on Vygotsky's work, validating the user's experiential odyssey, and transforming education into an active, gamified process wherein granular badges quantify and celebrate discrete moments, much like Vygotsky's zones of proximal development rendered visible through digital scaffolding, fostering reflective practice and communal knowledge construction amid decentralized learning ecosystems (Vygotsky, 1978: chap. 6-7). Far from the vertical hierarchies of traditional didacticism, these credentials engender a horizontal, rhizomatic framework of lifelong learning, where metadata-rich Open Badges document authentic trajectories of competence to honor the multifaceted tapestry of human growth (Gibson *et al.*, 2015; Digital Credentials Consortium, 2020).

Within this ecosystem, following Dewey's pragmatic ideals, education becomes a democratizing force. Thus, integrated through the European Union's Digital Education Action Plan 2021-2027 and the Council Recommendation on micro-credentials, these instruments forge a unified ethos of transparency and portability, rendering education not an elitist fortress but a communal garden where individual flourishing nurtures collective enlightenment (Council of the European Union, 2022)

Yet, this evolution is not without its dialectical tensions: while EU policies promise an optimisation of education, the overall impact might be less disruptive than it might seem, at least in the short term. Despite this aspirational vision, the evolution of micro-credentials is riven with contradictions and dialectical tensions. While European policy claims to optimize education, its disruptive potential may be limited in the short term due to enduring social stratifications—a reality illuminated by Bourdieu's theory of cultural capital. Those who already possess advantages are better positioned to benefit from micro-credentials, potentially exacerbating inequalities, rather than diminishing them.

In fact, micro-credentials can manifest a reductionist logic. Rather than advancing holistic education, they risk fragmenting curricula and knowledge, promoting a commodified vision of learning as atomized skill units. Bernstein's theory of performance pedagogy reveals how this process may transform learners into "homo economicus," perpetually investing in self-marketing while shouldering risks once absorbed by institutions (Bernstein, 2000; Wheelahan & Moodie, 2021). Where the mission of higher education is to empower vulnerable segments through holistic growth, micro-credentials may instead cultivate narrow specialization, undermining broader human flourishing.

This commodification paradoxically democratizes access while reinforcing existing hierarchies, as those with greater economic and cultural capital navigate digital validation systems with comparative ease, leaving excluded groups further marginalized (Bourdieu, 1986; Calderón Gómez, 2020). These developments not only alienate individuals but systematize the precarity of intellectual labor—granular credentials become “gig qualifications” that disintegrate professional identity into market-oriented units (Wheelahan & Moodie, 2022). Consequently, the epistemic rupture severs disciplinary coherence, transforming universities from sites of integrated wisdom into vocational supply chains (Wheelahan & Moodie, 2021).

The fundamental question thus emerges: is the human subject to be conceived as a mere aggregation of competencies measurable by the hour, subjected to the logic of economic utility rather than personal flourishing? The neoliberal redesign of educational purpose, as seen in the disciplining of curriculum for employability rather than holistic human development, risks reducing education to a set of purchasable outcomes, as Ragnedda *et al.* (2022) demonstrate in their analysis of digital capital accumulation and social inequality.

Micro-credentials, therefore, straddle a contradiction: they promise efficiency and broader access while threatening curriculum coherence and deepening the divide between self-actualization and economic instrumentalization. In a landscape already shaped by fragmented curricula and market metrics, the micro-credential paradigm could either exacerbate or rationalize these processes, perhaps embedding constructivist logic within learning trajectories but not fully resolving the structural tensions at play. Ultimately, these changes are fundamentally redefining the meaning, value, and pathways of intellectual labor and preparation in the contemporary economy.

Finally, it is crucial to recognize that technical barriers persist and exacerbates the previous critical points. Digital divides, as conceptualized by Calderón Gómez (2020), further compound unequal outcomes—cycles of technological (non)appropriation reinforce rather than alleviate stratification, especially among youth. Stark Eurostat data on unequal distribution of digital skills across European regions underscore that digital education—and thus access to digital education, to micro-credentials and open badges—risks benefiting those already privileged, amplifying existing disparities and jeopardizing the democratizing promise of the micro-credential framework

3. European Digital Disparities relevant for Digital Pedagogy

The European digital divide introduces technical and structural barriers to micro-credential adoption, exacerbating socioeconomic stratification through uneven access to digital infrastructure and skills. For instance, in the Netherlands 83% of individuals (and in Finland, 82%) exhibit basic digital skills, while other nations such as Romania (28%) and Bulgaria (36%) rank lowest among EU member states, as of 2023. This asymmetry, rooted in infrastructure and economic factors, reinforces Bourdieu's cultural capital dynamics, where pre-existing advantages amplify benefits for digitally privileged groups, potentially widening inequality gaps (Eurostat, 2023d)

Figure 1: Individuals with at least basic digital skills, by education level (Eurostat, 2023d)

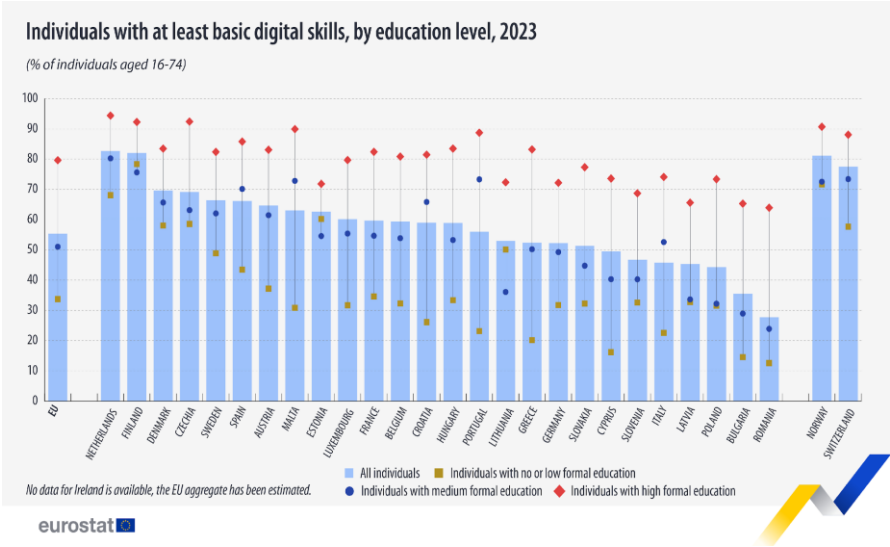
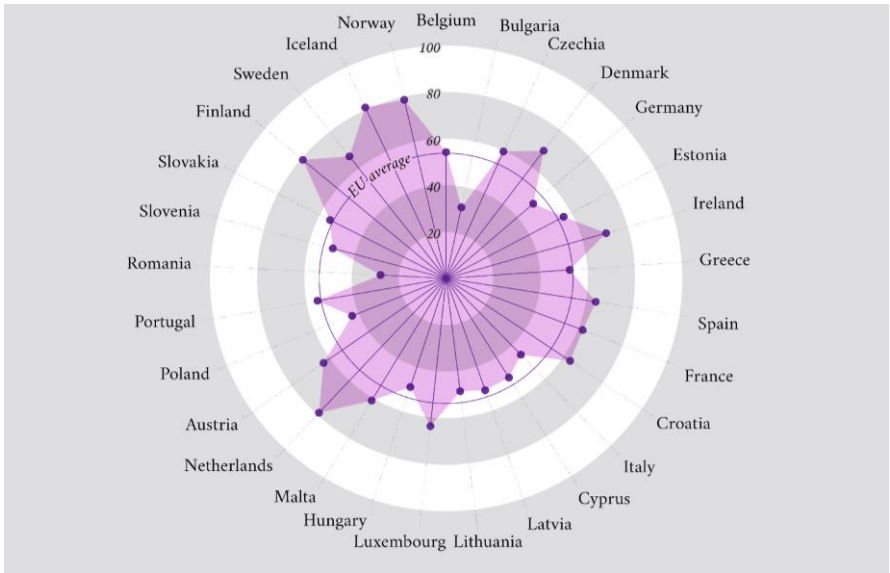


Figure 2: Digital literacy in the EU: An overview (Eurostat, 2023b)



Age-related stratification further complicates implementation: only 28% of individuals aged 65-74 possess basic digital skills, compared to 70% of 16-24-year-olds, creating generational exclusion from digital opportunities. Socio-economically, a 46-percentage-point gap exists between highly educated (80%) and low-educated (34%) populations, intersecting with rural-urban divides (91% rural vs. 95% urban internet access).

The urban-rural digital reinforces the disparity, imposing systematic barriers to equitable participation in micro-credential ecosystems, with rural populations exhibiting markedly lower basic digital skills (46%) compared to urban areas (61%) (Eurostat, 2023c). Compounding these differences, educational attainment further stratifies access to digital technologies, disproportionately benefiting those with prior high-level training and implying unequal opportunities in digital education. Specifically, a 46-percentage-point gap exists between higher education graduates (80% with basic digital skills) and individuals with low formal education (34%), with the largest disparities in Southern countries such as Portugal (66 percentage points) and Greece (63 percentage points), contrasted by more equitable patterns in Northern nations like Estonia (12 percentage points) and Finland (14 percentage points) (Eurostat, 2024b). These data notably identify as main targets for digital opportunities and thus digital education, open badges and micro-credentials the learners that already graduated.

Further critical perspectives on micro-credentials stem from institutional difficulties that undermine their effective deployment and equitable impact. According to the EUA Trends 2024 report, a majority of institutions cite insufficient human resources as a primary barrier, while 44% report inadequate external funding, highlighting systemic constraints on capacity-building and scalability. These resource limitations are compounded by inconsistent quality standards, which foster credibility concerns

and fragmentation; survey data from Project QUATRA-TPG A (2023)[†] reveal that 76.2% of respondents identify unclear quality assurance criteria as the most significant weakness, generating confusion among learners and employers about credential reliability. Although the referenced QUATRA-TPG A project provides also detailed guidelines for quality assurance, recommending involvement of stakeholders, alignment with NQF, etc. Therefore, it is noticeable that as for the moment, there are ongoing challenges and the need for disseminating clear frameworks.

All these disparities together reflect deeper structural inequalities extending beyond technological access to encompass socioeconomic, educational, and cultural dimensions of digital participation. Furthermore, these statistics may offer us the hypothesis that the main beneficiary of the lifelong learning through digital education, micro-credentials and open badges is the person that has at least basic digital skills, resides mostly in the northern EU regions, is already graduated and is living in urban areas.

4. Conclusions

In synthesizing the multifaceted landscape of micro-credentials within European higher education, this study explores their dual nature as both emancipatory instruments of constructivist pedagogy and potential amplifiers of neoliberal commodification, where the promise of granular, experiential learning (Gibson *et al.*, 2015; Council of the European Union, 2022) collides with profound ontological and sociological risks—reducing the human person to

[†] QUATRA-TPG A employs mixed-methods empirical research combining quantitative stakeholder surveys with qualitative institutional analysis to assess micro-credential quality assurance frameworks, utilizing Likert-scale instruments and thematic coding to identify systemic gaps in credentialing standards

quantifiable competencies and exacerbating stratifications through digital divides, institutional barriers, and cultural disparities (Wheelahan & Moodie, 2021; Bourdieu, 1986).

Methodologically, this exploratory inquiry has relied on documentary analysis of EU policies, Eurostat statistics, and institutional reports—comparing regional gradients and intersecting factors like age, education, and urban-rural gaps—to map implementation disparities within the fragmented contemporary context, thereby laying a foundational critique that balances optimistic visions of democratized lifelong learning with dialectical tensions of exclusion and precarization (Haughton & Singh, 2019; Kahle-Piasecki *et al.*, 2024). While this approach effectively highlights systemic obstacles, such as institutional resource constraints (European University Association, 2024) and unclear quality criteria of micro-credentials and open badges implementation (Project QUATRA-TPG A, 2023), its documentary scope serves as a preparatory scaffold for more nuanced interventions, underscoring the article’s objective to foster a holistic, equity-driven discourse on educational transformation.

To advance this exploratory utility, future research should incorporate primary empirical methods, including stakeholder interviews to capture lived experiences of learners, educators, and employers across diverse European contexts—potentially corroborating U.S.-based perceptions studies (Kahle-Piasecki *et al.*, 2024) through longitudinal tracking of employer attitudes, gamification’s impact on learning motivation, and the long-term effects of credential stratification on disadvantaged groups (OECD, 2023). Such extensions would not only mitigate methodological limitations but also inform policy integration, emphasizing ethical safeguards for democratic citizenship—where fragmented skills must not undermine holistic civic preparedness—and practical implications for inclusive frameworks that preserve education’s role

in social reconstruction, ultimately rendering micro-credentials a tool for genuine collective enlightenment rather than entrenched inequality.

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