FORCE Ai

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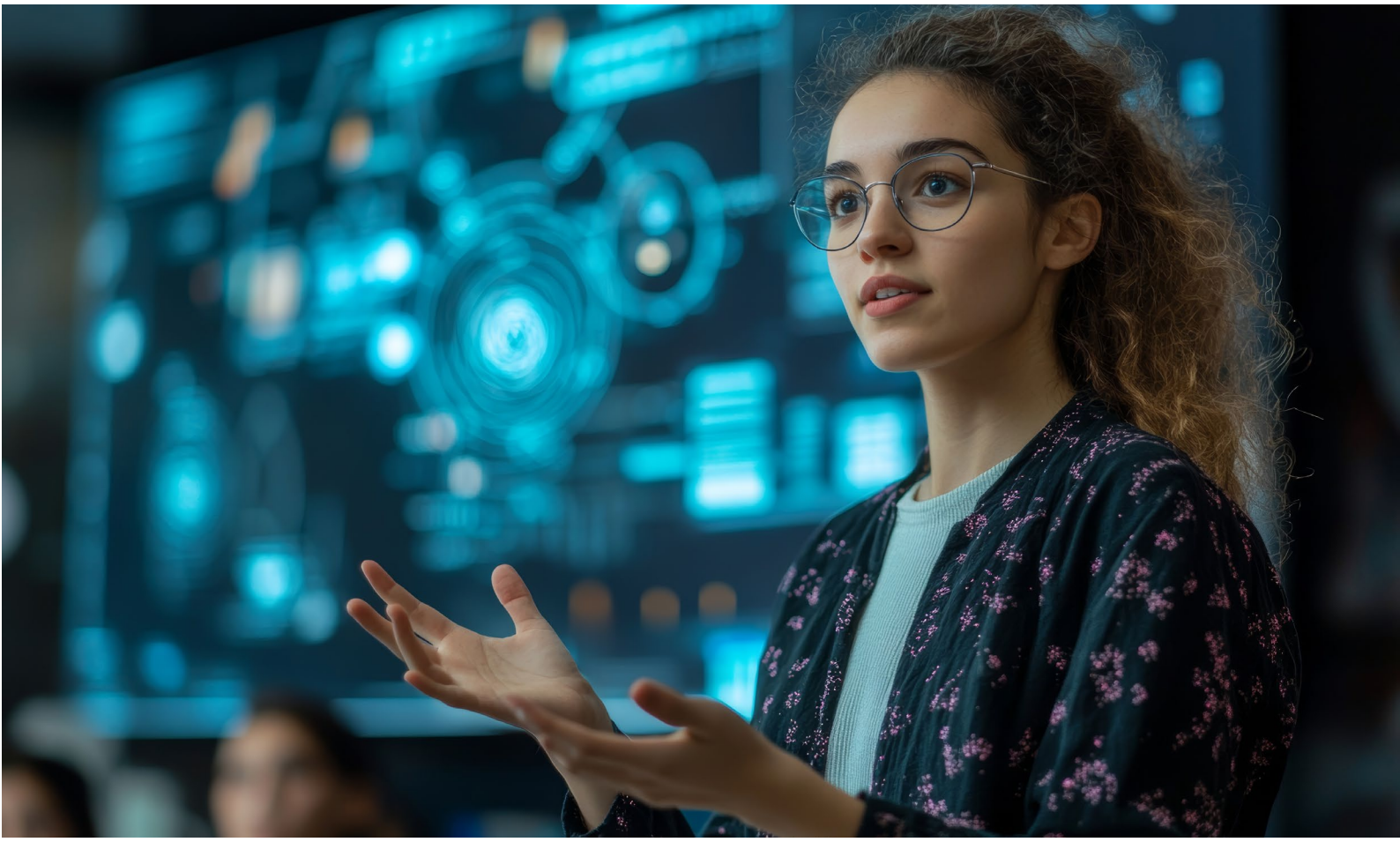
# AI Manager for Higher Education:

# Transnational Micro-Credential Framework



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# Contents

# Introduction

The global education landscape is undergoing its most significant structural transformation since the standardization of the university degree. Driven by the convergence of the fourth industrial revolution (Industry 4.0), the widening digital skills gap, and the demographic imperative for lifelong learning, the concept of micro-credentials has emerged as the primary vehicle for agile workforce development. Micro-credentials are no longer just a side project in educational technology; they have become a major part of transnational policy. For example, the Council of the European Union's 2022 Recommendation and the United Kingdom's Lifelong Learning Entitlement law change for student finance are both examples of this.

The purpose of this report is twofold: first, it is intended to provide a summary of the current landscape of transnational micro-credentials; second, it covers the Transnational Micro-Credential Framework for piloting the AIM4HE program. The first section is for those who want to learn about the global state of micro-credentials as well as those who want to create and offer transnational micro-credentials. The second section is an example of a micro-credential framework that can/will be used to create institutional frameworks.

## 1. The Global Landscape

The current landscape of micro-credentials is characterized by a tension between regional standardization and national marketization. Research indicates that while the micro-credential has ascended to the highest levels of transnational policy, its implementation varies significantly across borders.

### *1.1. Current Status*

The **European Union**'s (EU) approach represents the most mature and integrated attempt to build a continental micro-credential ecosystem. It is not just a policy suggestion; it is a technical plan to make the fifth freedom (the free flow of knowledge) easier. The strategy builds on the success of the Bologna Process, which made degree structures (Bachelor-Master-Doctorate) the same across Europe. The Microbol project[1] and IMINQA project[2] support the Thematic Peer Group C on Quality Assurance (TPG C), aiming to treat micro-credentials as a natural evolution of Bologna rather than a disruption. The central thesis is that if micro-credentials use ECTS credits, they automatically inherit the currency and transferability of traditional degrees. This allows for automatic recognition: a micro-credential issued in Estonia should be instantly readable and valued in France, just as a bachelor's degree is.

To enable this automatic recognition, the European Council Recommendation[3] mandates a specific data structure. The recommendation lists standard elements that must be present in every micro-credential. This is a move from "unstructured" certificates (which vary wildly in format) to "structured" data objects. These required standard elements are:

1. Learner identification: Unambiguous ID (e.g., National ID, Student Number).
2. Micro-credential title: Clear and descriptive.
3. Issuer identity: Name, status, and country of the awarding body.
4. Learning outcomes: Mapped to standardized vocabularies.

5. Workload: Expressed in ECTS credits or hours.
6. Level: EQF (European Qualifications Framework) or NQF level.
7. Assessment type: The method used to verify outcomes.
8. Quality assurance: Explicit reference to the QA mechanism used.

The technical realization of this policy is the European Learning Model (ELM)[4]. The ELM provides a standardized ontology (vocabulary) for describing learning. When a university issues a micro-credential via the Europass Digital Credentials (EDC)[5] infrastructure, it creates a data file (XML/JSON) that adheres to the ELM. There are two main aspects regarding ELM and EDC implementations: interoperability and e-seals. Interoperability: Because the data fields are standardized, any Europass-compatible wallet can read, display, and verify the credential without human intervention. e-Seals: The issuer applies a "Qualified Electronic Seal" (e-Seal). The seal functions as a digital seal of approval. It guarantees the authenticity of the origin and ensures that any tampering with the file renders it invalid. This method effectively eliminates credential fraud.

While Europe focuses on harmonization, the **United Kingdom** (UK) is undertaking a radical structural reform of higher education finance, treating the micro-credential as a financial unit within a marketized system. Scheduled for full rollout in the 2026/2027 academic year, the Lifelong Learning Entitlement (LLE) [6] will provide every eligible adult with a loan entitlement equivalent to four years of post-18 education. This entitlement can be used flexibly over a working life (up to age 60) for full degrees or modular courses. The goal of this policy is to eliminate the restrictive nature of student finance, which previously limited loans to full degree programs. The policy explicitly recognizes the possibility of modern learners dipping in and out of education.

A critical friction point in the LLE design is the eligibility criteria for funding. Currently, a module must be part of a designated full course and worth at least 30 credits to qualify for LLE funding. This 30-credit requirement represents approximately 300 hours of learning (1 credit = 10 hours in the UK system). This amount of time is significantly larger than the standard "micro-credential" found in the market, which typically ranges from 5 to 10 credits (50–100 hours). The Quality Assurance Agency (QAA) and Universities UK have argued that this threshold is too high. It forces providers to bundle smaller micro-credentials together to meet the funding rule, potentially reducing the flexibility that micro-credentials are supposed to offer. A learner seeking a specific 10-credit skill upgrade in Data Ethics, for example, may be compelled to pay directly or enroll in a 30-credit block they do not require[7]. The removal of Equivalent or Lower Qualification (ELQ) restrictions is a positive step, allowing learners who already have a degree to borrow money for another qualification at the same level (e.g., a graduate retraining in a new field). However, the complexity of residual entitlement calculations remains a bureaucratic hurdle[8].

To test the demand for LLE-style loans, the Office for Students launched a "Short Course Trial" in 2022. Despite expecting over 2,000 students, the results were stark: only 125 students enrolled, and only 41 took out a tuition fee loan[9]. This failure suggests that debt-financed loans may not be the right vehicle for short courses. Learners looking for micro-credentials often expect them to be employer-funded or low-cost enough to self-fund. The administrative burden of applying for a student loan for a short course proved to be a significant deterrent. The divergence between the UK and EU frameworks poses a risk to the portability of UK micro-credentials. If UK providers fail to adopt the ELM data standards, European

employers using Europass may not be able to read UK credentials[10]. Although the UK remains a member of the Bologna Process (which is non-EU), the loss of direct influence on EU tools like Europass means the UK is now a "rule-taker" rather than a "rule-maker" in technical interoperability.

Beyond the Europe-UK axis, other regions are developing frameworks that prioritize different societal goals, such as community development, indigenous rights, and validation of non-formal learning. **Ireland**, for instance, stands out as a global leader with the *MicroCreds* project[11], a systemic collaboration between the Irish Universities Association (IUA) and enterprise partners. MicroCreds is a national platform (microcreds.ie) that aggregates accredited micro-credentials from all partner universities. This solves the fragmentation problem where learners cannot find relevant courses. This strand formalizes the relationship between industry and academia. It creates a structured process for enterprise engagement, ensuring that new credentials are not just academic theories but are co-designed to meet specific skills gaps identified by employers[12].

The **Nordic network** (NLL)[13] emphasizes validation of prior learning (VPL). The focuses are legitimacy and trust. The framework explores how a micro-credential can be awarded not just for a course but for validating skills learned in the workplace. The challenge identified is *how the legitimacy of this recognition is ensured*. Or *is it validated by the state or by social partners (unions/employers) who assess the skills?*[14]

The African Continental Qualifications Framework (ACQF) perceives micro-credentials as a tool for facilitating transitions. In a continent with a massive youth population and infrastructure challenges in formal higher education, micro-credentials offer a flexible, scalable way to certify skills. The newly published handbook provides guidelines for **African nations** to integrate micro-credentials into their NQFs. The PoMiSA Project analyzes the state of play in Southern Africa (South Africa, Namibia, Lesotho, and Mauritius) and finds that while policy interest is high, implementation is often fragmented. The driver here is less high-tech manufacturing and more basic employability and entrepreneurship skills[15].

The Nicola Valley Institute of Technology (NVIT) in **Canada** provides a unique framework rooted in an Indigenous mandate. The framework says that micro-credentials must meet the needs of "Indigenous communities". It emphasizes removing barriers to entry (accessibility) and ensuring pathways to further learning. This challenges the purely "economic/neoliberal" view of micro-credentials, positioning them instead as tools for community empowerment and decolonization of the curriculum[16].

### *1.2. Key Challenges*

Current obstacles to the establishment of a functional micro-credential marketplace include the "Tower of Babel" problem, technological infrastructure, stackability, trust, quality, recognition.

#### 1.2.1. Description (The "Tower of Babel" Problem)

Without a unified taxonomy, stakeholders struggle to distinguish between a digital badge for participation, a short course for enrichment, and a rigorous micro-credential carrying academic credit. The research indicates that defining the *unit of learning* is the first and most critical step in framework design.

The Council of the EU adopted its Recommendation on a European approach to micro-credentials for lifelong learning and employability in June 2022. This definition is prescriptive and intended to function as legal text across member states. The Council defines a micro-credential as "the record of the learning outcomes that a learner has acquired following a small volume of learning. These learning outcomes have been assessed against transparent and clearly defined standards"[3]. The definition of a micro-credential rests upon four core, non-negotiable principles. First, it must involve *outcomes-based verification*, confirming the specific knowledge, understanding, or capabilities a learner possesses, going beyond mere duration of course attendance. Second, there is a *formal assessment* requirement, meaning qualification demands more than passive content consumption (e.g., viewing videos); a formal assessment against defined standards is mandatory. Third, it requires *authority and trust*, meaning it must be issued by a trusted entity (a higher education institution, VET provider, or industry body), distinguishing it from unverified "certificates of completion" from unregulated platforms. Lastly, the credential must have both independent and contributory value. This implies that the credential can both function independently and complement larger macro-credentials, such as degrees. Crucially, the EU framework makes a semantic distinction between the learning experience (the course or module) and the micro-credential (the proof of outcomes). This separation makes it possible to "credentialize" non-formal learning. For example, a learner might learn skills on the job but only get the credential after a formal assessment by an authorized body[17].

In the UK, the Quality Assurance Agency (QAA) has developed a *Characteristics Statement* to guide the sector. The UK approach respects the high level of institutional autonomy that UK universities possess, in contrast to the EU's top-down recommendation. The UK framework creates a binary between micro-credentials and macro-credentials: *Macro-credentials* are traditional qualifications (degrees and diplomas) that require minimum enrollment periods (e.g., one year full-time) and represent a broad synthesis of learning. Micro-credentials, on the other hand, are defined by how flexible they are and how small they are. A pivotal nuance in the UK definition is the assertion that a micro-credential offers an award but not a qualification[18]. This distinction—*award vs. qualification*—is critical for the UK's regulatory environment. Qualifications, such as a bachelor's degree, are protected learning outcomes that have a certain legal status. By classifying micro-credentials as awards, the QAA allows for greater flexibility in design but complicates their integration into national league tables and outcome metrics, which are typically calibrated for full qualifications[19].

In the Nordic context (Denmark, Sweden, Norway, Finland, Iceland), the definition is expanded to include *smaller learning units* that may not formally be termed micro-credentials but function as such. The Nordic network on validation (NLL) highlights that the definition should include the process of recognizing prior learning (RPL) as a valid way to earn a credential, regardless of whether it comes from a specific course[14].

In Australia, frameworks like that of Charles Sturt University (CSU) introduce a rigorous tiered definition based on hours, namely at least 40 hours of workload (2 points). Anything less than 40 hours is a "short course" and typically cannot be stacked for credit. This explicitly prevents the "fragmentation" of degrees into infinitesimally small units that lack academic coherence[20].

The following table contrasts the defining characteristics across major jurisdictions.

Table 1. *Comparison of approaches to micro-credentials*

| Feature | European Union (Council Recommendation) | United Kingdom (QAA/OfS) | Australia/Institutional (e.g., CSU) | Nordic Region (NLL) |
|---|---|---|---|---|
| **Primary Driver** | Cross-border portability & Citizenship | Employability & LLE Funding Eligibility | Stackability & Credit pathways | Validation of Prior Learning & Trust |
| **Volume of Learning** | "Small volume" (typically 1–59 ECTS) | No strict limits (5–40 credits common) | Defined by hours (e.g., <40 hrs vs >40 hrs) | Flexible; focused on outcome validity |
| **Assessment** | Mandatory; must be transparent | Mandatory for credit-bearing status | Required for "Credit-bearing"; optional for "Short Courses" | Essential for validation legitimacy |
| **Credit System** | ECTS (European Credit Transfer System) | CATS (Credit Accumulation and Transfer Scheme) | AQF (Australian Qualifications Framework) | National Systems / EQF alignment |
| **Key Constraint** | Must align with Bologna Tools (Diploma Supplement) | Must fit LLE funding rules (30 credits) to be publicly funded | Must meet "Subject" definitions (8 points) for stacking | Social Partner acceptance |

### 1.2.2. Technological Infrastructure and Interoperability Standards

For a micro-credential to be owned by the learner and portable, it must exist as a secure, interoperable data object. The era of the PDF certificate is ending; the era of the verifiable credential has begun. The technical backbone of the modern ecosystem is the *Open Badges 3.0* standard, managed by *1EdTech*[21]. Version 3.0 of the credential represents a significant evolution from earlier versions (1.0/2.0), which embedded metadata within a PNG. This new version is aligned with the W3C Verifiable Credentials standard, introducing two key advancements: rich, structured metadata and enhanced security. The credential is now a JSON-LD (JavaScript Object Notation for Linked Data) file, supporting comprehensive metadata such as the issuer's identity, issuance criteria, links to supporting evidence (like a portfolio), and alignment with competency frameworks (CASE standard). Furthermore, by

adopting W3C VC standards, the credential can be cryptographically signed, ensuring integrity and authenticity by immediately detecting any alteration to the data.

The shift to data objects necessitates a shift in storage — from the Learning Management System (LMS) to the *Digital Wallet*. When a student graduates or the subscription ends, they often lose the credentials stored in Canvas or Moodle.[26] Platforms like *Credly*, *Hyperstack*, and *Parchment Digitary* allow learners to "export" their credentials into a lifelong, portable wallet. *The Comprehensive Learner Record (CLR 2.0)* standard allows for the aggregation of multiple micro-credentials, degrees, and co-curricular achievements into a single, structured record. This "unbundles" the transcript, allowing a learner to show a specific slice of their skills to a specific employer[22].

The *European Blockchain Services Infrastructure (EBSI)* is being used to anchor these credentials. By publishing the "hash" of a credential to a blockchain ledger, verification becomes instant and decentralized. An employer does not need to call the university registrar; their system simply checks the blockchain to verify that the issuer (University X) did indeed issue Credential Y to Learner Z and that it has not been revoked[23].

### 1.2.3. Stackability, Trust, Quality Assurance and Recognition

Stackability, which involves combining small credentials into larger ones, is a crucial aspect of flexible learning, yet it encounters significant pedagogical and administrative challenges. There are two types of stackability: *Vertical stacking (laddering)* involves using micro-credentials as credit toward a degree. For example, the University of Aberdeen allows credits from FutureLearn micro-credentials to count toward an MSc in Psychological Studies. Similarly, the University of Colorado Boulder accepts Coursera MasterTracks as a pathway into their Computer Science master's. On the other hand, *horizontal stacking* involves collecting credentials to demonstrate breadth. A learner might stack "Project Management", "Data Analysis" and "Public Speaking" to qualify for a generic management role. Employers often value this experience more than universities do[24].

To maintain academic integrity, a degree must embody more than just a collection of credits. It must have a narrative arc and program-level outcomes. The Postgraduate Certificate in Academic Practice (PGCAP) case study illustrates that stackability works best when the micro-credentials are *pre-designed* as interlocking components of a whole, rather than trying to retrofit disparate courses into a degree later[25]. Universities often have residency rules (e.g., you must earn 50% of credits at this institution). This approach prevents the "Inter-University Campus" vision where a learner stacks a module from Sorbonne, a module from Trinity Dublin, and a module from Munich into a single European degree. The *Aurora Alliance* is actively working to harmonize these rules to enable true cross-border stacking[26].

Trust is the currency of credentials. If the market does not trust the assessment rigor, the micro-credential is worthless. The consensus in the EHEA is that creating a separate QA agency for micro-credentials is inefficient. Instead, the focus is on extending existing internal quality assurance mechanisms[27]. If a university is accredited to award degrees, its micro-credentials should fall under the same rigorous approval processes (e.g., Academic Boards, External Examiners). When a micro-credential is a component of an accredited degree, it inherits the QA of the parent program. This

strategy is the "safe harbor" approach for many HEIs[17].

Where providers are *not* self-accrediting universities (e.g., private training providers), external quality labels are emerging. For example, *Qualiopi*[28] in France is a mandatory certification for any provider accessing public funds. It involves an audit against 32 distinct quality indicators, ranging from resource planning to learner feedback mechanisms. Similarly, *EQAVET*, in the vocational sector, consists of a data-driven QA procedure. Key performance indicators (KPIs), like the employment rate six months after training, are used to check quality[29].

The rise of digital badges creates a new vector for fraud ("diploma mills" issuing fake badges). The combination of *e-Seals* (identifying the issuer) and Accreditation Databases (like DEQAR) provides a solution. A digital wallet can automatically check: Is this issuer present in the DEQAR database of accredited institutions? If yes, the badge is marked as "Verified"; if no, it is flagged as "Self-Asserted".

Surveys from Ulster University and AMTCE indicate a shift in recruitment in the industry. According to the study, 53% of employers report difficulty finding qualified candidates. They are increasingly turning to "skills-based hiring", valuing verified competencies over generic degrees.[29] Employers are overwhelmed by the volume of badges. They rely on "proxy" signals of quality. A badge from a known university or a badge aligned to a known framework is trusted; a generic badge is often ignored. In sectors like advanced manufacturing, the demand is for very specific, high-tech skills (e.g., CNC machining, robotics). These industries prefer micro-credentials that are competency-based (demonstrated mastery) rather than time-based[30].

#### 1.2.4. The Learner Experience

Ultimately, the main player of the ecosystem is the learners (who need skills). Research highlights a critical gap in the learner experience. Micro-credential learners are often "invisible" to the university's support systems. They may not have access to counseling, libraries, or student unions. Studies show that a lack of sense of belonging is a key driver of dropout rates. For non-traditional learners, particularly mature students from BAME (Black, Asian, Minority Ethnic) backgrounds, this alienation is compounded. Frameworks must explicitly encompass the pastoral care of micro-learners, in addition to their academic evaluation[24]. The "empowerment" narrative of micro-credentials often overlooks the fact that learners with complex identities (e.g., working mothers) need flexible deadlines and support, not just flexible start dates[31].

## 2. Recommendations for Design and Delivery

For institutions creating transnational programs, the following guidelines are mandatory for success:

The micro-credential framework is structured around essential criteria and a structural design focusing on strategic implementation and the concept of **stackability**. At its core, the legitimacy of any micro-credential rests upon the four pillars of legitimate micro-credentials. Specifically, a valid credential

must demonstrate clear, measurable *learning outcomes* for the learner. These outcomes must be validated through formal and rigorous *assessment* procedures to ensure high quality and official evaluation. Furthermore, the credential's credibility is ensured by its issuance by a *trusted* and recognized authority or institution. Lastly, the credential must have standalone recognition, indicating that it possesses inherent, independent value and receives acknowledgement even when not part of a full degree program.

A key design element of the framework is *granularity* for stackability. Micro-credentials are deliberately designed as small, flexible units (can be entitled as module, course, section, lesson, unit, etc) to seamlessly facilitate the "stacking" of skills over time. To keep this flexibility and focus, their size is strictly limited, from 1 ECTS credit (which is equal to 25–30 hours of learning) to a maximum of 5 ECTS credits. This small, focused unit size is crucial, as it empowers learners to quickly and efficiently acquire highly specific competencies, such as "Ethics in AI" without the significant time and financial commitment typically associated with a full academic degree program.

To truly allow educational systems to share, compare, and process results and qualifications easily across various platforms, schools, and countries, we need semantic interoperability. This concept surpasses simple data exchange (syntactic interoperability) by guaranteeing that machines understand the data's meaning universally and automatically. For learning outcomes, this machine readability requires a highly systematic and standardized approach to their definition and representation.

Rather than just using natural language descriptions that can be unclear and depend on context, learning outcomes need to be clearly organized and connected to strong, globally accepted classification systems. The core mechanism for this transformation is *tagging* with a Uniform Resource Identifier (URI).

The ESCO classification (European Skills, Competences, Qualifications, and Occupations)[32] serves as a primary example of such a standardized vocabulary. By linking every learning outcome to a specific, unique ESCO URI, we ensure the outcome is no longer just a string of text but a structured data object. The fundamental shift in practice is clear: educators and curriculum developers must tag, not just write. Simply documenting an outcome, no matter how precisely worded, is insufficient for system-level processing. The process demands that every outcome be analyzed, its core skills identified, and then formally associated with the corresponding external standard. This practice guarantees that:

1. Educational systems, job platforms, validation services, and AI-driven matching tools can instantly and accurately interpret the specific skill or competence represented by the outcome.
2. Outcomes become comparable across different educational institutions and national qualification frameworks because they all point to the same global standard (e.g., the same ESCO URI).
3. It eliminates the variability and redundancy introduced by synonyms, different phrasings, or context-specific jargon used by various content creators.

Consider a typical learning outcome: "Can evaluate AI”. While clear to a human reader, this phrasing could be interpreted in multiple ways by a machine (e.g., assessing AI's ethical implications, its performance metrics, and its technical architecture). Enforcing the tagging requirement rigorously maps this learning outcome to a specific skill.

*Original Outcome (Natural Language): "Can evaluate AI"*

*Formal Tag (ESCO URI): The URI corresponding to the ESCO skill "ICT system evaluation techniques"*

The system now processes the URI, not the free text. This transformation is crucial for applications such as:

- The process involves ensuring that the curriculum is comprehensive and aligned with professional standards.
- The process involves automatically connecting the certified skills of graduates to the requirements listed in job advertisements, which also utilize ESCO.
- The system recommends learning modules based on a machine's precise understanding of a learner's existing skills, which is identified through tagged outcomes.

In simple terms, *semantic interoperability*, which uses URI tagging, improves learning results by turning written descriptions into measurable data that machines can use, making it essential for today's connected digital economy.

The proliferation of micro-credentials necessitates a pragmatic and efficient approach to **quality assurance** that avoids bureaucratic redundancy. The core principle should be *reliance on existing authority*. Universities and Higher Education Institutions (HEIs) that have already recognized accreditation for full degrees should automatically be trusted to issue related micro-credentials. This existing accreditation acts as a de facto quality guarantor for their institutional processes, faculty expertise, infrastructure, and pedagogical standards. Creating new quality assurance agencies or complicated processes just for micro-credentials would waste time and resources and could slow down progress and innovation at established universities and higher education institutions. Trust in the existing, proven institutional accreditation system is the fastest and most reliable path to ensuring the quality and validity of micro-credentials issued by established educational providers.

As has been mentioned before, micro-credentials are stackable. However, simply accumulating individual learning outcomes does not automatically guarantee the learner can synthesize and apply those disparate skills in a holistic, real-world context. To make sure that learners can truly combine their skills in stackable programs, it's essential to have a required assessment model, like the capstone validity model. Under this model, a mandatory, comprehensive capstone project, assignment, or final portfolio is required. This capstone must be explicitly designed to force the learner to integrate and apply the skills and knowledge acquired across *all* the constituent micro-credentials in the stack. Critically, this capstone project can be designated as zero-credit (0 ECTS). The zero-credit designation ensures it does not inflate the overall credit burden of the qualification but retains its indispensable function: to validate the comprehensive application of acquired skills. The assessment should not just check if the learner remembers information or can show individual skills (which are already covered in each micro-credential) but should instead evaluate how well the learner can tackle complex problems, handle connections between different skills, and show real-world expertise in using all their skills together, proving that the learning path makes sense and works well.

To ensure effective **governance and widespread recognition** of micro-credentials, the consortium must adopt a two-pronged strategy. Firstly, a robust *consortium recognition* framework, serving as the root of trust, must be established through a legally binding Memorandum of Understanding (MoU)

signed by all partner institutions. This fundamental agreement ensures that a micro-credential badge issued by any single partner is automatically and unconditionally recognized and accepted by all others within the network. This shared commitment is crucial for building trust and utility for the credentials. Secondly, to optimize the operational process, a *streamlined centralized issuance* mechanism is necessary. A single, designated entity, ideally a technically capable partner like a well-known university, should serve as the sole primary technical issuer. This centralization aims to make the complicated steps of securely issuing e-Seals easier and to greatly enhance the efficiency and reliability of the verification process, which will help reduce possible administrative challenges and technical differences within the group.

Table 2. *Recommendations for transnational micro-credentials*

| Pillar | Principle/Topic | Key Action/Definition |
|---|---|---|
| Strategic Design | 4 must component | Micro-credentials must be:<br>1. Outcomes-based<br>2. Formally assessed<br>3. Issued by a trusted authority<br>4. Have standalone value |
| | Granularity for Stackability | Design learning units (lesson, course, unit, section, module, etc.) between 1 (25–125 hours) and 5 ECTS. |
| Semantic Operability | Tag, Don't Just Write | Map the learning outcomes to a Uniform Resource Identifier (URI) from the ESCO classification system. |
| Quality Assurance | Leverage Existing Accreditation | If a university is trusted to issue degrees (ESG compliant), it should be trusted to issue micro-credentials. |
| | The "Capstone Validity" Model | Include a capstone project (0 ECTS or more) for programs covering more than one course to prove competence. |
| Governance and Recognition | Consortium MoUs | Partners sign an MoU for automatic recognition of badges within the consortium ("Root of Trust"). |
| | Centralized Issuance | Designate one partner (e.g., HEIs) as the primary technical issuer (e-Seals, verification). |

## 3. AIM4HE Transnational Micro-Credential Framework

This framework is prepared to provide insight about the rationale, design, and evaluation of the Artificial Intelligence Manager for Higher Education (AIM4HE) micro-credential program. The framework was created in accordance with the European Council Recommendation to ensure transparency, portability, and trust. It focuses only on the piloting phase of the AIM4HE Program and intends to support the FORCE-AI Project partners in creating their own institutional frameworks in later phases of the project.

### 3.1. Identification

| | |
|---|---|
| *Learner Identification:* | AIM4HE Micro-Credential Program Piloting will be offered to those learners verified by the FORCE-AI Project Partners, no additional identification will be sought |
| *Program Title:* | Artificial Intelligence Manager for Higher Education (AIM4HE) Program |
| *Target Groups:* | Higher education administrative and academic staff<br>Digital transformation leaders<br>IT and data governance professionals<br>Staff preparing for or acting in AI management roles<br>Students in all levels who plan to seek a position as AI Manager or staff at higher education institutions |
| *Type:* | The micro-credential program consists of 6 separate courses and a capstone project. Piloting of the program will require an online guided study mode. |
| *Certification and Issuer:* | **The Course Participation Certificates** will prove that a participant completed all the requirements of a course. A total of 6 participation certificates (one for each course) will be available. While **the AIM4HE Certificate** will show that a participant has completed all the requirements of the training and earned the micro-credential.<br><br>The primary issuer is the **University of Twente (Netherlands)**, acting on behalf of the transnational partnership, including partners from Germany (FHM), Latvia (RISEBA), and Türkiye (Anadolu University). |
| *Level:* | The course is classified at EQF Level 6, but it can also be considered equivalent to Level 7. |
| *Workload:* | 155 hours (6 ECTS-equivalent, formal/non-formal recognition). Details provided below. |

### 3.2. Need for the AIM4HE Micro-Credential Program

In 2026, the demand for qualified AI managers in higher education has transitioned from a niche preference to a critical labor market necessity. A substantial skills gap has arisen as educational institutions move away from using AI in "experimental" ways and toward integrating it into their core infrastructure. Current labor market data reveals that while over 90% of institutions have a work-related AI strategy, only a small fraction possess the dedicated leadership required to manage its ROI, ethical compliance, and operational integration. This has created a high-stakes environment where the lack of specialized AI management directly correlates with competitive disadvantage, cybersecurity vulnerabilities, and inconsistent academic policies [33].

The labor market is increasingly rewarding "AI capital," with managerial roles requiring AI competencies seeing wage premiums of up to 15%. However, the market supply of professionals who can orchestrate these systems—balancing technical automation with human-centric judgment—remains dangerously low [34]. The AIM4HE micro-credential directly addresses this "skills mismatch" by training a new tier of professionals: the AI manager. These people are the "human gatekeepers" that the market needs—leaders who can handle the change that has made AI-related tasks a part of 56% of higher education jobs [35]. By formalizing these competencies, the program ensures that HE institutions are not just adopting technology but are led by qualified experts who can drive productivity while safeguarding institutional integrity.

### 3.3. Description

The AIM4HE micro-credential program is designed to equip those who are working or planning to work as an AI manager or who want to be in a team of AI management in a higher education institution with the strategic, ethical, and practical competencies required to foster the responsible integration of artificial intelligence in academic institutions. In addition to developing strategic, ethical, and technical competencies in AI management, the AIM4HE program also encourages participants to adopt a sustainability mindset. As AI systems increasingly impact environmental, social, and economic dimensions, the training incorporates elements of green skills—such as systems thinking and digital literacy. The program fosters sustainability awareness and encourages responsible innovation. Through course activities and capstone projects, participants are guided to consider the ecological impact of AI implementation, promote sustainable digital practices, and contribute to greener, more inclusive higher education ecosystems.

The AIM4HE training program consists of six courses, each aligned with a key area of expertise outlined in the AIM4HE qualification profile, developed as a deliverable of the FORCE-AI Project. The program is designed with flexibility and accessibility in mind, offering a modality-independent learning experience that allows participants to engage with the content in ways that best suit their individual and institutional contexts. The piloting will be conducted as an online guided study, which means that learners will mainly learn asynchronously along with synchronous reflection sessions offered in local languages by every project partner in appropriate schedules. Each partner will transform the program into a self-paced MOOC (massive open online course) for all those interested in learning after the piloting. Besides, the training and materials will be transformed into open educational resources (OERs) so that they can be downloaded and used as part of fully online, blended, hybrid, or face-to-face formats, enabling institutions and learners to adapt the program to their preferred mode of delivery via their learning management systems. This format ensures wide applicability for diverse professional development settings while maintaining consistent quality across modalities. The curriculum is

designed to support formal learners pursuing certification as well as non-formal learners seeking professional development through self-paced study. The recognition pathways for non-formal learners will be established through internal validation mechanisms at each institution.

The micro-credential program ends with a capstone project—like an AI audit plan, an implementation idea, or a trial project—so that participants can use what they've learned in real situations at their institutions. Quality assurance is embedded throughout the program, aligned with the ESG (European Standards and Guidelines) for higher education, and supported by continuous monitoring through learning analytics and peer review processes. This procedure guarantees both academic rigor and a real-world effect.

### 3.4. Program Goal and Learning Outcomes

The program aims to create and offer training that helps higher education staff become AI managers, who can effectively and ethically use AI in their schools' academic, administrative, and tech areas, while allowing each institution to maintain its own way of doing things.

Upon completion of the full AIM4HE program, participants will be able to:

1. Analyze institutional digital infrastructure, data dependencies, and AI system capabilities to select optimal and responsible AI solutions for higher education challenges.
2. Design comprehensive institutional AI strategies and roadmaps that align the university's mission with relevant ethical and regulatory frameworks.
3. Lead interdisciplinary AI innovation projects and institutional transformation by utilizing agile methodologies and performance indicators (KPIs).
4. Guide the ethical, transparent, and sustainable implementation of AI systems by integrating legal, social, and environmental responsibility into institutional decision-making.
5. Communicate complex AI topics effectively to diverse stakeholders and build collaborative networks to facilitate successful, responsible AI adoption.
6. Initiate AI-related professional development and capacity-building programs that align with global digital education strategies.

### 3.5. Program Structure

The program consists of six courses and a capstone project. The following table shows the courses and workloads as well as ECTS values.

Table 3. *Program information*

| Component | Title | Workload (ECTS) |
|---|---|---|
| Course 1 | AI Literacy in Higher Education | 25 h (1) |
| Course 2 | Strategic Leadership in AI Governance | 25 h (1) |
| Course 3 | Innovation and Change Management | 25 h (1) |
| Course 4 | Ethics, Integrity and Social Responsibility | 25 h (1) |
| Course 5 | Communication and Collaboration for AI Transformation | 25 h (1) |
| Course 6 | Capacity Building | 25 h (1) |

| | | |
|---|---|---|
| Capstone | Institutional AI Governance & Capacity-Building Plan | 5 h |
| | TOTAL | 155 h (6) |

### 3.6. Assessment

During the piloting, the learners' achievements in the training are assessed via completion of course activities, including assignments, quizzes, and the final capstone project. The following table is recommended to course designers for a standard assessment strategy.

Table 4. *Recommended assessment strategy*

| Instrument | At least | Ratio (%) |
|---|---|---|
| Completion of the asynchronous activities | %75 | 40 |
| End-of-course quizzes | Average 75 | 20 |
| Completion of the capstone project | %100 | 40 |
| TOTAL | | 100 |

Those who complete all the courses and the capstone project will receive an AIM4HE Certificate (Micro-credential). The micro-credential confirms that a participant has fulfilled all the requirements of the training.

To complete each course successfully, participants must achieve at least 75 points in total. The course completion criteria are as follows:

- Completion of at least 75% of the asynchronous activities in the respective course in Moodle
- Successful completion of the course quiz (at least 75% correct answers).

Participants who meet these criteria will receive a Certificate of Participation. Those who do not achieve the required score may repeat the course. The Certificate of Participation confirms that a participant has fulfilled all the requirements of a course. A total of six Certificates of Participation can be obtained.

The final certificate and course participation certificates will be issued by the University of Twente (UT).

### 3.7. Quality Assurance and Evaluation

The effectiveness of the AIM4HE Training is evaluated via the following metrics:

- Course assessment results
- Course evaluation results
- End of training evaluations
- Designer and trainer evaluations
- Facilitator evaluation

The course participation certificates and the micro-credential are recognized by partner institutions. Also, they are recognizable by any EU higher education institution.

Quality assurance (QA) in the AIM4HE programme is designed to ensure academic rigor, relevance, transparency, and continuous improvement, in line with European higher education principles and

relevant European policy frameworks for micro-credentials, digital education, and lifelong learning. The program design also reflects principles of constructive alignment, ensuring coherence between learning outcomes, teaching and learning activities, and assessment methods.

Quality assurance is embedded from the initial design phase through:

- Transnational partners with complementary expertise jointly develop the curriculum.
- The program and course learning outcomes are aligned with the AIM4HE Qualification Profile and ESCO competence descriptors.
- Prior to content development, partner institutions peer review the course concepts and learning scenarios.
- Verification of workload, assessment balance, and level appropriateness to ensure consistency with ECTS principles, even where formal credit recognition is determined by each partner responsible for design and development of the course.

During delivery and piloting, quality is monitored through multiple mechanisms:

- Learner analytics collected via the virtual learning environment (e.g. participation rates, completion data, assessment results).
- Formative learner feedback gathered through module- and course-level evaluation instruments.
- Peer observation and review, whereby partner institutions review course delivery, materials, and assessment practices.
- Trainer reflection reports documenting strengths, challenges, and improvement actions after each delivery cycle.

Synchronous sessions conducted during piloting also serve as qualitative feedback points, allowing facilitators to identify learner needs, misconceptions, and contextual adaptation requirements.

The following factors ensure the quality of the assessment:

- Clear assessment criteria and rubrics aligned with course and program learning outcomes.
- Use of both formative and summative assessment methods to support learning progression.
- Transparency of assessment requirements communicated to learners in advance.
- Capstone project assessment using a standardized rubric applied consistently across institutions.

Guidance on responsible AI use in assessments reinforces academic integrity principles where applicable.

The program follows a cyclical review process:

- The program conducts an aggregated analysis of assessment outcomes, learner feedback, and completion data following the pilot or delivery cycle.
- We base our qualitative evaluation on partner reflections and external stakeholder input, if available.
- The process involves identifying necessary revisions to learning outcomes, content, assessment, or delivery methods.

- We ensure transparency of changes by documenting updates to curriculum materials and Open Educational Resources (OERs).

Major curriculum reviews are planned at defined intervals or following significant regulatory, technological, or policy developments related to AI in higher education.

While the AIM4HE curriculum provides a common quality-assured framework, partner and adopting institutions retain autonomy regarding:

- Formal recognition and credit attribution
- Local quality assurance procedures
- Integration into institutional professional development or degree structures.

This approach ensures both transnational consistency and contextual flexibility.

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