

A micro-credential on formative assessment for pre- and in-service teachers: evidence from an Italian trial

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Introduction

Interest in micro-credentials is growing rapidly, though their development remains in its early stages and is marked by a number of significant challenges. These challenges are related to the lack of a shared, common understanding of what micro-credentials are and what purpose they serve; insufficient standardisation across countries and institutions, which creates barriers to recognition and portability; limited awareness among employers and learners of their value; and the difficulties involved in integrating micro-credentials into existing education systems and qualification frameworks (OECD, 2021).

Micro-credentials certify the outcomes of short-term learning experiences, such as short courses or training sessions, offering a flexible and targeted approach that supports individuals in developing the skills and knowledge required for their personal and professional growth. Provided by a diverse range of public and private organisations, these learning opportunities are positioned as an alternative to traditional qualifications and respond to the

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increasing demand for more flexible, learner-centred education and training. The spread of micro-credentials is also seen as a powerful means of widening access to education and training, particularly for disadvantaged and vulnerable groups (European Union, 2022).

In this context, the project “Learning to learn through micro-credentials in a regional setting” (L2L Microcred, ref. 2024-1-NO01-KA220-ADU-000256871) aims at improving self-efficacy and employability of disadvantaged learners through the co-developing of high quality, open access micro-credentials in three Higher Education Institutions (HEIs) in Europe and one in Australia. The consortium includes Inland University of Applied Sciences (Norway, leading organization), the University of Limerick (Ireland), LUMSA University (Italy) and Central Queensland University (Australia). The target group of the micro-credentials developed through the project are adults, who need to enhance their employability and life-skills.

This paper presents the development of the micro-credential created by the LUMSA’s research team and the first results of the try-out with 72 in-service and pre-service primary and pre-primary teachers, the selected target group in Italy. The focus of the micro-credential was identified through a comparative need analysis process, implemented by all consortium members in the first months of the project. During this phase, LUMSA’s research team carried out interviews and focus groups to relevant stakeholders (teachers and members of the advisory board)¹ to identify those professional competences future and in-service teachers need for upskilling and reskilling. The need analysis highlighted two key areas: one related to methodological competences for teachers (e.g., teaching methods, assessment, innovative learning environment), and one focused on social and organizational competences (e.g., student-teacher relations, classroom management) (Fioretti & Svoen, 2025). Of the two areas, LUMSA’s research team decided to focus its attention on teachers’ methodologies and chose formative assessment as the main topic of their micro-credential. Tackling formative assessment, and specifically the provision of formative feedback, allowed researchers to upskill and reskill both teachers’ teaching and assessment competences.

Starting from the theoretical and methodological background that guided the creation of the micro-credentials across partner countries (the L2L pedagogical toolbox, the learner profile, the storyboard and the task planner), this article will show the first results of the trial, with a specific focus on the reflecting journals, drafted by the pre-service and in-service teachers

¹ The advisory board were made up of experts in the field of e-learning, adult education and teachers’ professional development.

involved in the try-out. These journals provide an in-depth perspective on the micro-credential experience and its links to professional competences development and practices. The thematic analysis of the corpora from the reflecting journals highlighted the development of learning and professional awareness gained through the completion of the micro-credential. The study highlights the potential of micro-credentials to support meaningful professional development in teacher education while providing a model for designing learner-centred, transferable micro-credentials.

1. The L2L Pedagogical Toolbox

The pedagogical toolbox is a primary research-informed outcome of the L2L project and was produced through a collaborative and iterative process by partner organisations in Ireland, Norway, Italy, and Australia. The toolbox was co-developed through the systematic identification and analysis of learner needs across partner countries (Svoen et al., 2025). This included competence needs, learning preferences, support requirements, and participation barriers experienced by disadvantaged adult learners. The toolbox thus represents a set of pedagogies and design tools drawn from the institutional contexts of each partner.

This section argues that the toolbox represents an empirically grounded, learner-centred framework for designing inclusive micro-credentials.

The findings of this research served as a basis for creating a practical pedagogical framework for educators to create learning experiences that are accessible, relevant, and respond to the realities of learners' lives. The four targeted learner groups were drawn from diverse socio-economic, educational, and regional settings. These included SMEs in Ireland, teachers in Italy, at-risk youth in Australia, and labour market transitioners in Norway. Despite these differences, comparative analysis identified similar trends across all participating countries. The diverse learner groups reported barriers such as lack of time due to other commitments, conflicting personal and professional obligations, low confidence, previous poor educational experiences, and concerns about access to technology and their own digital capabilities (Svoen et al., 2025).

On the other hand, learners consistently reported positive attitudes towards learning experiences that were practical and applicable to current or future workplaces; easily understood, and had structured pathways for progression; and flexible enough to meet their complex lifestyles (Svoen et al., 2025). Additionally, they stated strong preferences for engaging in learn-

ing by doing; applied learning; opportunities for discussion and reflection; and working in learning environments where they felt supported and valued (Svoen et al., 2025). These recurrent patterns formed the empirical foundations for the pedagogical underpinnings of the toolbox, and reinforces the inadequacy of content-heavy, passive delivery models.

The toolbox's development followed a learner-centred design approach. This design philosophy emphasises educators deriving pedagogical decisions from evidence related to learners rather than making assumptions about subject matter or instructional methods (McCombs & Whisler, 1997; Weimer, 2013). For example, the toolbox places an emphasis on the need to explore learners' characteristics, motivations, barriers to learning, and their support requirements prior to developing any curricula. This learner analysis operationalises key principles of learner-centred and human-centred educational design. Specifically, it requires educators to articulate clearly distinctions between evidence and assumptions so that all subsequent design decisions will be grounded in well-documented evidence about learners' specific needs (McKenney & Reeves, 2018). Furthermore, the toolbox addresses one of the core findings of the need analysis, carried out in the first phase of the project: that many adult learners do not become disengaged from learning opportunities simply because of a lack of motivation or capacity; however, they may be dissuaded by educational systems that fail to take account of the complexities and realities of their daily lives (Cross, 1992; Merriam & Bierema, 2014).

Additionally, the structure of the toolbox reflects many of the principles of Constructive Alignment. That is, learner needs, learning outcomes, learning activities, assessment strategies, and evaluation processes are systematically interrelated (Biggs, 1996). After conducting a comprehensive learner analysis, educators follow a sequential design process that progressively transforms learner insights into course designs and delivery plans. This process is informed by consistent evidence across the four participating countries that learners place high value on clarity, coherence, and transparency within course designs. Therefore, specifying explicit alignments serves both pedagogical and inclusive purposes. It enhances learning while also providing clarity and certainty for learners at different stages of their learning journey.

Some of the unique features of the toolbox relate to several aspects of learner preference that emerged from the cross-national research. For example, across all four countries participants indicated strong preferences for practical (workplace-oriented), experience-based learning, a finding consistent with established understandings of adult learning (Knowles, 1978). Participants preferred "learning by doing", problem-based learning,

project work, authentic tasks, and opportunities to apply their learning to real-world problems rather than passive content consumption. These preferences informed the development of the toolbox's recurring "Learn-Discuss-Apply" structural design template. This template provides a simple organising framework for designing courses and activities. Despite its simplicity, it reflects key principles from experiential learning (Kolb, 2014) and social constructivism (Vygotsky, 1978).

First, learners are introduced to new ideas and concepts. Secondly, learners are encouraged to discuss and critically reflect with peers. Thirdly, learners apply the principles to authentic contexts and practical problems. Thus, the Learn-Discuss-Apply structure integrates cognitive, social and experiential components of learning while retaining sufficient flexibility for application across disciplines, institutions and delivery contexts.

Participants consistently highlighted that confidence, self-efficacy, and belonging are critical factors supporting participation and engagement in education (Bandura, 1997; Svoen et al., 2025). As such, across countries learners reported common fears about failing academically, lack of confidence in their own abilities, or carrying long-lasting scars from previous poor educational experiences. Given these findings, the toolbox incorporated a variety of scaffolding strategies designed to build confidence and promote progressive learner growth. Examples include managing workload, enabling lower threshold entry points, clear instructions, embedding easy early successes, regular feedback, and support in-built throughout the learning process. These features are aligned with Self-Efficacy Theory and Scaffolded Learning Theory and recognize that successful participation often relies as much on learners' perceptions about their ability to succeed as it does on what is being learned (Schunk & DiBenedetto, 2020; Usher & Pajares, 2008).

Reducing cognitive load was another important design consideration. Comparative analysis continually cited cognitive overload and complexity as contributing to disengagement (Svoen et al., 2025). To address this, the toolbox advocates modular learning. This involves shorter, less complex activities supported by consistent structures across courses. Moreover, the toolbox promotes simplicity and clarity without sacrificing intellectual rigor. This represents a pedagogy for increasing participation rather than decreasing academic expectation (Mayer, 2024; Sweller, 1998).

Furthermore, accessibility and inclusion served as guiding principles throughout the entire development of the toolbox, incorporating key Universal Design for Learning principles (Rao et al., 2023; CAST, 2018). Data from the cross-country comparisons showed that learners desired flexible modes of participation, accessible learning materials, and opportunities to partici-

pate according to their individual circumstances and preferences (Svoen et al., 2025). Although there were differences in preferences related to delivery modes (with some preferring face-to-face interactions and others desiring flexibility), there was general consensus concerning the need for choice and flexibility in terms of how they can engage. Therefore, the toolbox moves beyond viewing accessibility as a compliance requirement. Instead, it positions accessibility as a foundational element for enabling participation among diverse learners.

The comparative research findings also indicate that disadvantaged learners value social interaction and collaboration with peers in order to learn with and from them (Svoen et al., 2025). Opportunities for discussion and interaction with peers emerged as commonalities across all four countries. These findings inform the toolbox's emphasis on deliberately designing opportunities for social learning. The framework also acknowledges that social interaction should be meaningful rather than obligatory, thus encouraging educators to design social learning opportunities that benefit students cognitively, emotionally, and socially.

Finally, an additional advantage of utilising the toolbox lies in its iterative nature. Similar to Learning Design/Design-Based Research paradigms (for example: Design-Based Research Collective, 2003; McKenney & Reeves, 2019) the toolbox does not view course design as a linear process. Rather, it views development as occurring in a cyclical fashion. The last section of the toolbox focuses specifically on implementation and improvement, acknowledging that assumptions made during design cannot be confirmed until actual delivery occurs. An iterative improvement process was also identified in collaboration among stakeholders during development, reflecting an understanding that educational design is a dynamic and evolving entity.

In summary, the Toolbox presents a synthesis of empirical evidence and existing pedagogical processes and strategies that guide educators in creating inclusive micro-credentials based on learner needs, preferences, motivations, and barriers. Designed as a tool for educators, the toolbox operationalises a range of established pedagogical concepts. These include learner-centred design, constructive alignment, adult learning theory, experiential learning, social constructivism, self-efficacy, universal design for learning, and cognitive load management. Of particular significance is that these approaches were not imposed prior to analysis but rather emerged from comparative analysis of learner needs and realities across four national contexts. Therefore, beyond serving as an aggregation of design tools it also offers an empirically-supported model for designing inclusive micro-credentials that will address the diverse realities faced by disadvantaged adult learners. Its potential for

transferability stems from its roots in empirical evidence, theoretical frameworks, and pedagogical flexibility.

2. A micro-credential on feedback for Italian teachers

As previously illustrated, teachers and prospective teachers were identified as the target group for the development of the Italian L2L micro-credential. In recent years, initial teacher education in Italy has undergone a substantial reform following the introduction of the one-year postgraduate teacher qualification programme (60 ECTS), established by Legislative Decree No. 59/2017 and subsequently regulated by the Prime Ministerial Decree of 4 August 2023. Within this programme, universities may allocate a variable number of hours to Educational Assessment, with the specific aim of equipping future teachers with the knowledge and skills required to use assessment effectively to support student learning. However, given the breadth of disciplinary content included in the programme, several classroom assessment topics cannot be addressed with the operational depth necessary to ensure their effective implementation in everyday teaching practice.

By contrast, it is well established that teachers devote a substantial proportion of their working time to assessment-related activities, including grading student work, alongside lesson planning and administrative responsibilities. Assessment therefore represents one of the major components of teachers' workload (OECD, 2025).

According to Popham (2003), the relationship between teaching and assessment appears straightforward, and precisely for this reason it may be misleading. A common assumption is that effective teaching naturally leads to positive assessment outcomes: better teaching results in higher student achievement. Although seemingly intuitive, this relationship can be problematic as students have different opportunities to learn and begin with heterogeneous achievement levels, or learning achievement may be measured through narrow or time-limited assessments, and numerous other contextual factors influence learning outcomes, issues with which experienced teachers are well acquainted.

More importantly, Popham states that the reverse relationship is often overlooked: when assessment is designed and implemented effectively, it can significantly improve teaching. The relationship between teaching practices and assessment practices is therefore fundamental. When teachers fully recognise and understand this reciprocal relationship, assessment can become a powerful driver of instructional improvement and teaching effectiveness.

A substantial body of evidence indicates that teachers' classroom assessment literacy – that is, the knowledge and skills required to design, select, interpret, and use high-quality assessments – is a critical component of effective teaching. Assessment literacy enables teachers to collect valid evidence of student learning, provide meaningful feedback, adapt instruction accordingly, and ultimately improve student learning outcomes (Hull & Vigh, 2025; Yan et al., 2022).

More specifically, formative assessment plays a foundational role in directly supporting and enhancing student learning (Black & Wiliam, 1998; Hattie & Timperley, 2007). However, effective formative assessment extends beyond the administration of accurate and high-quality classroom assessments; it also requires the productive use of assessment evidence to foster learning processes. According to Stiggins et al. (2006), five key principles underpin high-quality classroom assessment, which can be grouped into two complementary dimensions. The first dimension concerns the accuracy of assessment and comprises: 1) a clear purpose, 2) clear learning targets, and 3) sound assessment design. The second dimension concerns the effective use of assessment and includes: 4) effective communication, and 5) student involvement. While the technical aspects related to assessment accuracy are generally addressed within initial teacher education programmes, the systematic and intentional use of communication strategies to maximise the educational value of assessment results often receives less attention.

This imbalance implicitly reflects the continuing predominance of summative assessment over formative assessment at school. In summative contexts, assessment results are typically communicated through grades, marks, or reports that primarily serve certification purposes, either by indicating the extent to which students have met predefined standards or by ranking their levels of achievement.

By contrast, communication occupies a central role in formative assessment. Developing teachers' ability to provide timely, task-focused, growth-oriented, and actionable feedback can substantially enhance students' learning experiences. Feedback, together with constructive approaches to error management, shifts the teacher's role from evaluator to learning coach, promoting greater student engagement, self-regulation, and learner autonomy. At the same time, the systematic use of feedback transforms assessment into a meaningful resource for future learning by informing instructional planning and supporting teachers' ongoing professional reflection.

Given its central role in closing the feedback loop between instructional design, teaching practices, and student learning, feedback was selected as the focal theme of the Italian L2L micro-credential.

3. Developing the micro-credential “Providing feedback to support and improve learning”

In accordance with the pedagogical toolbox, the micro-credential was created as a flexible training tool, that could be implemented in a blended mode, through asynchronous and synchronous sessions, with an input-action-feedback approach. The course needed to be short, focused, practice-oriented, with diverse materials and activities, the provision of feedback on the tasks completed by the users and a space for personal reflection about the learning and its implications on the teachers’ professional development.

The creation of the micro-credential was anchored to the development of four different instruments: the learner profile, the course blueprints, the storyboards and the task planners. These instruments guided the whole course production (from identifying the target groups’ learning needs to the development of the course’s modules) and allowed the alignment of the micro-credential’s objectives, structure and activities.

In detail, the learner profile was aimed at tailoring the course on the target group needs, identifying the relations between the main characteristics of the target group and specific aspects/notes on design of the micro-credentials (Figure 1).

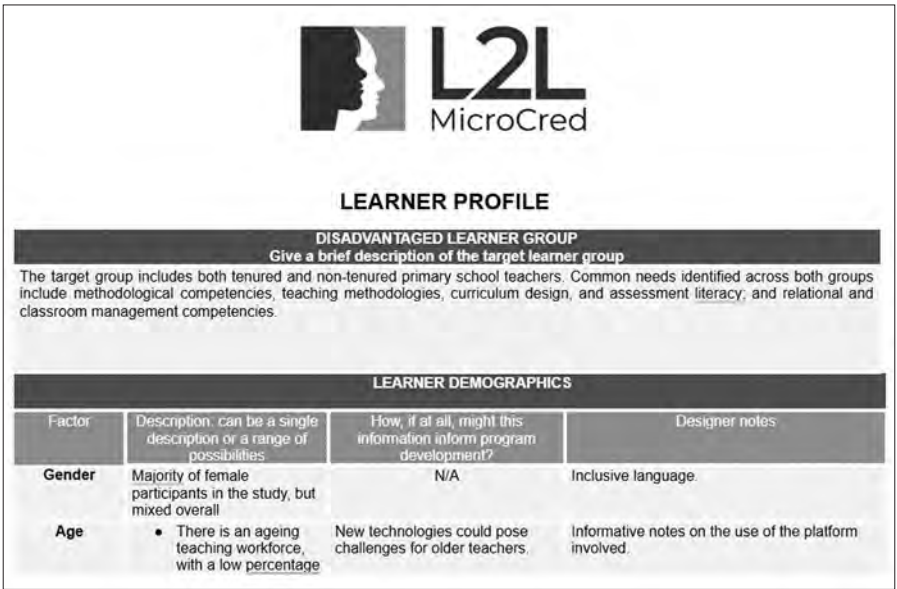


Figure 1 – Example of the learner profile

LUMSA's target group was made up of a majority of female pre-service and in-service teachers, with an age included between 20-65 years old, mainly resident in the Lazio region. Their professional background consisted in an upper secondary diploma to teach in pre-primary and primary schools or in a masters' degree programme in Primary Education (to be still achieved by pre-service teachers). Their professional experience was largely related to the teaching in primary schools, with permanent and non-permanent contracts. Prospective teachers had no continuous professional experience and were full time students.

The learner profile has also made it possible to highlight the following key aspects that guided the development of the micro-credential:

- the career objectives relevant to the target group. Two career objectives were identified: preparation for the national examination to become a teacher, the development of competences required to fulfil the roles of support staff, of digital facilitators and university tutors in the master degree programmes for prospective teachers;
- learner motivation: within the total number of training hours per year stipulated in the national collective agreement for teachers, activities should be carefully tailored to the identified training needs and the immediate application of knowledge and skills in everyday teaching practice;
- learning preferences: the course delivery should be primarily asynchronous, with flexible study times and a number of synchronous sessions. It should include interactive materials and tools, such as exercises, examples and multimedia content (videos, images, links to websites for further reading). The course should provide navigation support (e.g., initial assistance in understanding how to use the platform and the presence of a tutor available to answer queries) and should ensure a high level of interaction amongst participants through virtual spaces and sessions for peer-to-peer exchange and feedback. Experiential learning (stimulus-action-response approach) through case studies and personal reflection activities should be at the heart of the learning process;
- barriers to learning. Three main barriers were identified: 1) low teacher engagement, due to the lack of formal recognition of the micro-credential certification in national examinations to become a teacher and due to limited opportunities for career progression after securing a permanent post; 2) time constraints, with teachers struggling to balance full-time teaching commitments, personal life and professional development activities; 3) low levels of digital literacy amongst participants, with some teachers lacking sufficient confidence and skills in using online tools and platforms.

The course blueprint (Figure 2) was developed taking into consideration the key aspects included in the learning profile and provided an overview of the micro-credential, in terms of aims, duration, delivery (in person, online or blended), technical requirements, main modules.



COURSE BLUEPRINT

COURSE VISION One sentence description of what the course is aiming to achieve	COURSE NAME
The course aims to provide participants with teaching strategies for producing and communicating formative feedback to support the learning process of primary school students.	Providing feedback to improve and support learning
ECTS/CREDITS (if any)	COURSE DURATION
1	online course presentation (1 hour) + 4 weeks modules + final event and assessment
INSTRUCTOR PROFILE(S) Background, teaching philosophy, skills, achievements, awards, etc.	
DELIVERY Determined by the Learner Profile	
In-Person ☐ Online ☒ Blended ☒	
COURSE DESCRIPTION State clearly and precisely what the course is about	
This micro credential is focused on one of the most important aspects of classroom assessment, i.e. feedback to improve and sustain students' learning. Feedback represents a powerful tool to scaffold learning processes at schools, but often it can be misleading if its contents and strategies of delivery are not appropriate to the situation. Effective feedback can both address cognitive needs and boost motivation to learn, making the student aware and "in control" of his/her learning process.	

Figure 2 – Example of the blueprint

The course, organised into four modules plus a final face-to-face event, aimed to achieve five main objectives:

- to use basic formative assessment tools and techniques to monitor learning in real time;
- to understand and recognise the value of feedback in teaching and learning processes, distinguishing formative from summative assessment;
- to choose appropriate times and methods for providing feedback, tailoring it to the task and learning objectives;
- to analyse and classify the constituent elements of a feedback message;
- to formulate effective and personalised feedback based on an analysis of the teaching situation.

The content of each module is detailed in Table 1.

Table 1 – *Main content of the modules*

Module 1	Distinguishing judgements and feedback
Module 2	The feedback as a teaching and learning practice
Module 3	Feedback for students: what? How? Why?
Module 4	Feedback as a learning experience

The modules, implemented on a Moodle Platform, were structured to allow for flexible and self-directed learning within the relevant week, during which each module was activated. The timeframe for completing the micro-credential was approximately four weeks (from 23 February to 22 March 2026), one week for each module of the course. The modules were never locked: if participants were unable to complete a module within the week in which it was activated, they could continue with the activities into the following week. The final in-person event took place on 16 April 2026 and focused on the overall evaluation of the course and of the micro-credential experience through the administration of a questionnaire and the implementation of a focus group.

Completing the course and attending the final event gave participants the opportunity to earn an open badge – a digital certification that officially recognises the skills acquired during a training programme. The open badge can be verified online, contains detailed information on the knowledge and skills developed, and can be easily shared on CVs, LinkedIn or other professional platforms.

Finally, the storyboard and the task planner supported the course developers in building each module, identifying the different approaches to learning (formal, social and experiential learning) that each module addressed

(through the storyboard) and detailing the structure, the materials and the activities included in each activity (through the task planner). The task planner comprises three main sections: task details (task's title, format, learner takeaway, media/tech needs, licence); task content (key terms, content areas, content progression, expected learner actions); accessibility. Table 2 shows an example of the synergy between the storyboard and the activities of the task planner, in relation to the first module.

Table 2 – *Extracts of the storyboard and of the task planner for Module 1*

<i>Storyboard – Module 1 “Feedback and judgements are not the same”</i>	<i>Task planner</i>
Formal learning (Introduce core concepts and theoretical foundations relevant to the topic): What feedback is and what it is not Why feedback matters for learning Checking core concepts	Task 1.1: Define feedback in learning. Short video lecture (10 min) + slides (infographic overview) + multiple choice items Task 1.2: Relevance of feedback for learning. Interactive reading with embedded closed questions (True/False items) Task 1.3: Engage – Checking core concepts. Self-check test (auto-marked cloze test)
Social learning (Encourage reflection, collaboration, and knowledge sharing): How do I feel when I receive feedback? (online forum)	Task 1.4: Introduce yourself and your ideas on feedback (Forum discussion)
Experiential learning (Enable learners to apply what they've learned in a meaningful, authentic context): Feedback or judgement? A mini-case study; Reflection: Journal entry: “What surprised you most about this example?”	Task 1.5: Application of concepts. Mini-case study + three analysis questions + short reflection and journal entry

The use of various tools to create the micro-credential ensured consistency in the course design and enabled it to be tailored to the learning needs of the target group. The focus on progression between formal learning, social learning and experiential learning enabled each module to be structured around a sequence of prompts and activities that quickly became easily recognisable to learners, effectively guiding them through their learning journey: a short video or interactive/visual material introducing the module's content, followed by short passages and review questions (formal learning); discussion forums in which, prompted by a question, participants were encouraged to respond (social learning); and a case-based, reflective task in which participants analysed a real classroom episode using authentic material and recorded their reflections in the sections dedicated to the reflective journal at the end of each module (experiential learning).

4. The micro-credential through the lens of the participants: the reflecting journals

The article presents the first results from the try-out of the micro-credential through qualitative analysis of four corpora of reflective journals, compiled by course participants at the end of each module. Reflective journals are a well-established reflective tool in educational research: as Moon (2006) highlights, they allow access to the personal processing of the learning experience, making visible the thinking of the person in training at the very moment they engage with new content and practices. The reflective elements from teachers (both pre-service and in-service) regarding the path undertaken and the possible impact of the training on their professional activity (present and future) represent the first key elements for understanding, in depth and from the different subjectivities involved, whether and to what extent the various modules proved effective and what stimuli they offered participants, with a view to continuing professional development and reflection on professional practice. In this perspective, reflective journals become instruments that document a learning process in action (Schön, 1983).

The collected material was subjected to thematic analysis following the method proposed by Braun and Clarke (2006), which unfolds across six progressive and iterative phases: familiarisation with the data, generation of initial codes, searching for themes, reviewing themes, defining and naming, and producing the analytical report. This is a flexible qualitative approach, particularly suited to the analysis of narrative and reflective texts, following an inductive approach. Through thematic analysis, meaning categories were progressively identified from the extracts, through a coding process that led to the identification of recurring semantic patterns across the four corpora. The four corpora analysed correspond to the course modules and gave rise to distinct sets of categories. Each category identified in the present work includes a direct quotation drawn from the reflective journals, selected as a representative example of the theme. It is important to clarify that thematic analysis, as conceived by Braun and Clarke, aims at interpretive richness, that is, the reconstruction of meaning that participants (in this case, course participants) attribute to the learning experience carried out through the micro-credential.

The corpus comprises 72 reflections from try-out participants for each module (making a total of 288 reflections), entered in the specific sections of the reflective journals. As specified in the previous paragraph, each journal section included a prompt designed to elicit participants' reflection. Table 3 reports the prompts for each module.

Table 3 – *Reflective prompts for each module*

Module 1 – Distinguishing judgements and feedback	What struck me most about this activity?* If I have had a similar experience, either as a teacher or a student, what sort of feedback did I give or receive? How might feedback affect learning?
Module 2 – The feedback as a teaching and learning practice	Which aspects do I think will be most useful to me in my professional practice?
Module 3 – Feedback for students: what? how? why?	What did I learn from analysing Anna’s work and the feedback given to her?** What do I think is the most challenging aspect of giving feedback?
Module 4 – Feedback as a learning experience	When I think back to a time when I gave feedback, what did I learn from the feedback I provided? Have I had a feedback experience which, as a teacher, has enabled me to learn a great deal?

* Course participants were asked to reflect on Flavio’s case study, see below.

** Course participants were asked to reflect on Anna’s case study, see below.

The sections that follow report the semantic categories identified through thematic analysis.

4.1. Module 1 – From Flavio’s case study to participants’ personal experience

The reflections included at the end of Module 1 are connected to the analysis activity of the proposed case study, namely that of Flavio, a second-grade primary school student, who received written feedback from his teacher at the end of a notebook activity. In the case study, the feedback becomes a starting point for reflection on lived experiences: before exploring its main characteristics, participants are asked to reflect on the feedback they received as students. Four categories were identified for this corpus:

- 1) The emotional impact of feedback on the person: “Feedback can affect the whole person as a whole”.
- 2) A judgement or generic feedback as a missed opportunity: “It is not enough to say ‘well done’ or ‘pay more attention’ – one must clearly explain what to correct and how to improve”.
- 3) The impact of feedback on motivation and learning: positive feedback fuels the desire to learn; negative feedback can distance students from learning. “When I received this negative feedback from my history teacher in my second year of secondary school, I completely shut down and became fearful of that subject – the exam I dreaded most at university was precisely the history one”.

“The impact of feedback on learning is total: it can be a bridge towards autonomy or a wall that distances the pupil”.

- 4) Biographical mirroring: approximately one in four participants responded by recounting a personal episode from their time as a student. “I happened to live a similar experience as a student, in which feedback turned into a judgement, becoming a reason for me to lose self-esteem. I still remember that oral examination today”.

4.2. Module 2 – Feedback as a professional technique

In this module, students were prompted to engage with the *Goldilocks Principle* (Hattie and Timperley, 2007) and to consider how to embed feedback within teaching practice (in terms of timing, approach, and the selection of type and quantity of information to provide). Participants’ reflections here take on a more technique-oriented character, as demonstrated by the six categories identified, which relate back to the *Goldilocks Principle*:

- Identifying the recipient of feedback: “Feedback can be given to the group or to the individual – it is important to know who I am talking to, otherwise there is a risk of losing them”.
Calibrating the quantity of information: “If a child completes ten operations and always gets the carrying wrong, do not mark ten errors in red pen – that is too discouraging. Highlight only the first two and write the feedback”.
- When to give feedback: “I found the module interesting because it highlighted the importance of giving feedback in a timely manner. One should not wait, otherwise it loses its effectiveness”.
- Using language appropriate to the recipient: “Words like ‘coherence’ or ‘cohesion’ sound precise to us, but for a child they risk being mere distant sounds. What they need is to understand concretely where to place their foot to take the next step”.
- Selecting the appropriate mode of feedback: “The aspect I think will be most useful to me is always remembering to choose the right mode for feedback: written, oral, demonstrative, or guided conversation depending on the situation”.
- Preventing future errors (feedforward): “From now on, when I sit next to a child, I will not just want to tell them ‘where they are’ or what they got wrong, but make sure I always answer the question: ‘How can we move forward together?’ Only then will that feedback become their own personal achievement and not just a red mark in the notebook”.

4.3. Module 3 – Feedback as a communicative act

The reflective prompt derives from the analysis of the case study, included at the end of this module, on the feedback that Anna received on her assignment. The case study completes the various activities undertaken, centred on the characteristics and the implications of the feedback message. Six categories were identified:

- 1) Finding the balance between correction and encouragement: “The aspect I find most complex to manage when providing feedback is the very delicate balance between the need to correct errors and the need to safeguard the student’s sense of self-efficacy”.
- 2) Process and self-regulation at the heart of feedback: “I have learned that valuing the ‘how’ a student corrected an error (self-regulation) is even more important than correcting the error itself, because it builds autonomy”.
- 3) Limiting comparison with others: “It is essential that comparison be individual rather than social. By avoiding comparison with classmates, a genuine sense of personal growth and self-efficacy is fostered in the child”.
- 4) Promoting self-efficacy and motivation: “The main challenge for us, as future teachers, is to sustain motivation while avoiding triggering a defensive withdrawal in the pupil. We must be able to separate performance from person, weighing our words carefully so that the child does not feel ‘wrong’, but perceives having received a concrete tool for their own growth”.
- 5) Designing feedback: “when planning a teaching activity or a learning unit, one must plan the time to be dedicated to feedback itself”.
- 6) The linguistic appropriateness of feedback for learning: “The most difficult aspect to manage, as far as I am concerned, is the formulation of feedback that is linguistically clear and comprehensible to the child, capable of orienting and guiding them towards what they could improve”.

4.4. Module 4 – Feedback as teacher learning

At the end of this module, focused on feedback understood as an episode of reciprocal learning, a moment in which students and teachers learn together, participants had the opportunity to reflect more deeply on the impact of the course on their professional practice, and on how feedback represents a valuable tool for both students and teachers. The three categories identified include:

- 1) Feedback as reciprocal learning. This category, the largest in the entire corpus, presents various participant perspectives on feedback as an opportunity for mutual learning, also in terms of instructional planning: “I

was able to verify that involving pupils in the assessment process promotes in them a sense of agency in their own learning. Moreover, I observed how in this process I too learn, reorient, and improve my own teaching capacity”.

- 2) “Feedback is not a verdict, but an uninterrupted dialogue. If we view it in the traditional way, we might picture it as a monologue: the teacher speaks (or writes in red) and the student receives passively. If instead we were to regard feedback as an episode of reciprocal learning, it could become a moment in which both protagonists of the classroom pause to observe ‘how’ learning happens, transforming a simple task into a co-construction of meaning, into a cycle of formative and dynamic assessment, for the student and for the teacher”.
- 3) The importance of eliciting process: “I have learned that providing the ready answer is of no use if I first do not ask ‘how did you get there?’ In this way I understood that my role is not to correct an outcome, but to accompany a line of reasoning, often discovering perspectives I would never have thought of”.
- 4) The emotional and relational dimension: “I have come to understand how fundamental the emotional sphere is in learning. This aspect needs to be guided and supported especially in early childhood, where children have difficulty understanding their own emotions. It is always better to be cautious in choosing language that does not burden them with anxiety”.

The thematic analysis allows us to highlight certain elements shared across participants’ reflections throughout the completion of the four modules. First and foremost, there is a shared conviction, developed during the micro-credential, that feedback does not mean correcting an error or delivering a judgement, but rather entering into a relationship with a person (the student) who is learning, eliciting the self-regulatory and motivational dimension of the learning process. This element is present, transversally, in all modules, articulated differently each time depending on the focus topics, but never called into question.

The perspective through which this central element is presented and becomes the object of reflection varies, however, from module to module. Beginning with Module 1, in which Flavio’s case study activates participants’ memories and gives rise to reflections rooted in personal experience. Module 2, by contrast, presents more operational reflections, oriented towards the practice of giving effective feedback. The reflections of Module 3 appear more critical and analytical, stemming precisely from Anna’s case study and the analysis of an ineffective feedback example. Finally, in Module 4,

participants offer more systemic considerations, at the end of the course, in which feedback is no longer merely a tool for the student, but a process that transforms the teacher.

5. Perfecting feedback strategies improves teachers' awareness on assessment

The central focus of the micro-credential developed for Italian in-service and prospective teachers was the role of feedback within formative assessment and instructional practice. Its primary objective was not only to strengthen participants' knowledge and skills in this area but also to enhance their awareness of assessment as a communicative process within the classroom.

According to Sato et al. (2008), the first of the six “gold standards” of assessment concerns the potential uses of assessment evidence and the perspectives through which such evidence is interpreted. Raising teachers' awareness, throughout every stage of the assessment process, of which forms of evidence are most relevant and how the information collected can be used to improve student learning and inform instructional decision-making, is therefore of paramount importance. The systematic use of assessment evidence to adapt teaching strategies, learning activities, and instructional content – and, more broadly, to promote flexibility in instructional design on a day-to-day basis – represents an essential dimension of high-quality teaching.

Equally important is the quality and appropriateness of the feedback provided to students, particularly regarding the level of detail offered and its capacity to enable learners to identify concrete actions for further improvement. This, too, constitutes one of the gold standards of effective assessment. Furthermore, high-quality assessment can act as a catalyst for developing students' capacity for self-assessment and fostering greater self-regulation in learning. These outcomes largely depend on teachers' ability to communicate assessment information effectively and purposefully.

The analysis offered here highlights a significant implication: for professional development to be truly effective, it must influence teachers' awareness and underlying conceptions of assessment. In educational practice, assessment is rarely perceived primarily as an act of communication with learners. Rather, communication is generally associated with teaching itself, where transmitting knowledge and engaging students in the co-construction of understanding are regarded as the central activities. Consequently, teachers often have limited opportunities to reflect on the communicative effects

of assessment results beyond their function as generic positive or negative reinforcement.

This represents a missed opportunity, both for fostering students' engagement with learning and for enabling teachers to understand more deeply what it means to experience learning from the students' perspective. Effective communication inherently requires the ability to adopt the learner's point of view, making assessment a relational as well as a technical practice.

A seminal review of teachers' assessment literacy by Looney et al. (2017) conceptualises the development of assessment literacy as a pyramid comprising multiple interacting dimensions that shape teachers' assessment practices. At its foundation lie pedagogical knowledge of assessment and subject-specific assessment expertise. These knowledge bases are inevitably mediated by each teacher's epistemological beliefs about learning and by the ethical values underpinning their educational practice.

Higher levels of the pyramid incorporate the contexts in which assessment is enacted, including both the broader socio-cultural environment and the specific school context, such as the characteristics of the student population, the professional culture of the teaching staff, and school leadership. These contextual factors inevitably require teachers to negotiate between theoretical principles and the practical realities of classroom assessment. Professional experience progressively consolidates teachers' identities as assessors, particularly when it is accompanied by critical self-reflection, collaboration with colleagues, professional dialogue, and the co-construction of new pedagogical knowledge.

However, the assessment process does not end when a grade is assigned or a judgement is expressed – actions that often appear definitive. Rather, as the present analysis demonstrates, effective feedback opens new opportunities for dialogue, reflection, and reciprocal learning by focusing on learning as an ongoing and inherently open-ended process.

Teachers' awareness of the impact of assessment on students' self-efficacy, motivation, and emotional well-being is fundamental to creating safe learning environments in which errors are viewed not as failures to be penalised but as valuable opportunities for deeper cognitive engagement. Developing expertise in every aspect of feedback – from selecting appropriate evidence to determining its timing, form, and language – enables teachers to gain deeper insight into students' learning processes. In doing so, teachers move beyond the role of evaluator to become facilitators of increasingly autonomous, self-regulated learners.

Against this backdrop, the blended-learning micro-credential designed for this professional development initiative appears to represent a promising

approach to fostering teachers' awareness of assessment as a communicative practice. The programme deliberately combined opportunities for reflection at multiple levels, encouraging participants to connect their experiences with broader pedagogical principles and biographical reflection on their own experiences as learners. This multi-layered reflective design supported teachers in critically examining the communicative dimension of assessment and feedback, thereby promoting a shift from viewing assessment primarily as a mechanism for certification towards recognising its potential as a tool for supporting learning. Further analyses drawing on learning analytics and stakeholders' perspectives will contribute to a more comprehensive evaluation of the micro-credential's effectiveness and provide additional evidence regarding its educational value and transferability.

References

- Bandura, A. (1997), *Self-Efficacy: The Exercise of Control*. New York: W.H. Freeman.
- Biggs, J. (1996), "Enhancing teaching through constructive alignment", *Higher Education*, 32 (3), pp. 347-364.
- Black, P., Wiliam, D. (1998), "Assessment and classroom learning", *Educational Assessment: Principles, Policy and Practice*, 5 (1), pp. 7-74.
- Braun, V., Clarke, V. (2006), "Using thematic analysis in psychology", *Qualitative Research in Psychology*, 3 (2), pp. 77-101.
- Braun, V., Clarke, V. (2019), "Reflecting on reflexive thematic analysis", *Qualitative Research in Sport, Exercise and Health*, 11 (4), pp. 589-597.
- CAST (2018), *Universal Design for Learning Guidelines version 2.2*, retrieved from <http://udlguidelines.cast.org>.
- Cross, K. P. (1992), *Adults as learners: Increasing participation and facilitating learning*. New York: John Wiley & Sons.
- Design-Based Research Collective (2003), "Design-based research: An emerging paradigm for educational inquiry", *Educational Researcher*, 32 (1), pp. 5-8.
- European Union (2022), *Council Recommendation of 16 June 2022 on a European approach to micro-credentials for lifelong learning and employability*, available at [https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32022H0627\(02\)](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32022H0627(02)).
- Fioretti, F., Svoen, B. (2025), "Enhancing teacher professional development through micro-credentials: emerging insights and challenges", *Cadmo*, 2, pp. 53-68, DOI: 10.3280/CAD2025-002004.
- Hattie, J., Timperley, H. (2007), "The power of feedback", *Review of Educational Research*, 77 (1), pp. 81-112.
- Hull, P., Vigh, T. (2025), "Teachers' assessment literacy: A descriptive literature review", *Hungarian Educational Research Journal*, 15 (2), pp. 210-225, DOI: 10.1556/063.2024.00317.

- Knowles, M. S. (1978), “Andragogy: Adult learning theory in perspective”, *Community College Review*, 5 (3), pp. 9-20.
- Kolb, D. A. (2014), *Experiential learning: Experience as the source of learning and development*. Upper Saddle River: FT Press.
- Looney, A., Cumming, J., van Der Kleij, F., Harris, K. (2017), “Reconceptualising the role of teachers as assessors: teacher assessment identity”, *Assessment in Education: Principles, Policy & Practice*, DOI: 10.1080/0969594X.2016.1268090.
- Mayer, R. E. (2024), “The past, present, and future of the cognitive theory of multimedia learning”, *Educational Psychology Review*, 36, pp. 1-25.
- McCombs, B. L., Whisler, J. S. (1997), *The Learner-Centered Classroom and School: Strategies for Increasing Student Motivation and Achievement*. San Francisco: Jossey-Bass.
- McKenney, S., Reeves, T. (2018), *Conducting educational design research*. London: Routledge.
- Merriam, S. B., Bierema, L. L. (2013), *Adult learning: Linking theory and practice*. New York: John Wiley & Sons.
- Moon, J. A. (2006), *Learning Journals: A Handbook for Reflective Practice and Professional Development*. London: Routledge.
- OECD (2021), “Micro-credential Innovations in Higher Education: Who, What and Why?”, *OECD Education Policy Perspectives*, No. 39. Paris: OECD Publishing.
- OECD (2025), *Results from TALIS 2024: The State of Teaching, TALIS*. Paris: OECD Publishing, <https://doi.org/10.1787/90df6235-en>.
- Popham, J. W. (2003), *Test better, teach better. The instructional role of assessment*. Alexandria: ASCD.
- Rao, K., Gravel, J. W., Rose, D. H., Tucker-Smith, T. N. (2023), “Universal Design for Learning in its 3rd decade: A focus on equity, inclusion, and design”, *International Encyclopedia of Education*, 6, pp. 712-720.
- Sato, M., Wei, R. C., Darling-Hammond, L. (2008), “Improving Teachers’ Assessment Practices through Professional Development: The Case of National Board Certification”, *American Educational Research Journal*, 45 (3), pp. 669-700.
- Schunk, D. H., DiBenedetto, M. K. (2020), “Motivation and social cognitive theory”, *Contemporary Educational Psychology*, 60, 101832, pp. 1-10.
- Schön, D. A. (1983), *The Reflective Practitioner: How Professionals Think in Action*. New York: Basic Books.
- Stiggings, R. J. (2006), “Assessment FOR learning. A key to student motivation and achievement”, *Phi Delta Kappan EDGE*, 2 (2), pp. 3-19.
- Svoen, B., Dobson, S., Kristiansen, L., Thorsplass, I., Hundevadt, M. O., Johansen, L. T., Fioretti, F., Agrusti, G., Damiani, V., Bloomfield, C., Purnell, K., Larkin, G., Shee, B., Brady, S., Carroll, G. (2025), *Learning to learn: Competence needs and barriers for marginalised adults – Regional insights and solution pathways from Italy, Australia, Ireland and Norway (L2L MicroCred), WP2 Competence Needs Summary Report, Erasmus+ Project 2024-1-NO01-KA220-ADU-000256871*, INN University.

- Sweller, J. (1988), "Cognitive load during problem solving: Effects on learning", *Cognitive Science*, 12 (2), pp. 257-285.
- Usher, E. L., Pajares, F. (2008), "Sources of self-efficacy in school: Critical review of the literature and future directions", *Review of Educational Research*, 78 (4), pp. 751-796.
- Vygotsky, L. S. (1978), *Mind in society: The development of higher psychological processes*, Vol. 86. Cambridge: Harvard University Press.
- Weimer, M. (2013), *Learner-centered teaching: Five key changes to practice*. New York: John Wiley & Sons.
- Yan, Z., et al. (2022), "Teachers' assessment literacy improves teaching efficacy: The mediating role of psychological capital and professional identity", *Frontiers in Psychology*, 13, pp. 1-12.