



Teacher education is a deeply pedagogical process rooted in values, ethics, and the social purpose of schooling. Globally, it sits at the core of educational quality and fairness, as research in comparative and international education demonstrates: the training of teachers directly influences students' learning chances, social inclusion, and the democratic aims of schools. Teachers are not simply transmitters of curricula, but active professionals whose convictions, reflective skills, and ability to manage the complexities of classroom life give shape and substance to the educational experience itself.

The pedagogical dimension of teacher education frames teaching as a relational, context-aware, and ethically grounded profession rather than just a set of procedural skills. From a research perspective, this demands robust research methodologies that can critically examine the complex realities of schools and inform evidence-based policies. Equally important is the connection between theory and practice, which helps to bridge the persistent gap between universities and schools.

The contributions gathered in this volume reflect the richness and diversity of experiences showcased during the ATEE Spring Conference 2024, held at the University of Bergamo from May 29 to June 1, 2024. The volume presents 70 selected papers out of more than 300 presented by researchers representing over 40 countries.

This broad spectrum of studies highlights promising directions that can inspire renewed inquiry and concrete proposals aimed at improving contemporary educational systems.

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ATEE Spring Conference 2024

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Teacher education research in Europe: trends, challenges, practices and perspectives

May 29th – June 1st, 2024
S. Agostino, Bergamo



Edited by Nicole Bianquin and Francesco Magni





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BOOK OF PROCEEDINGS

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Exploring the Transformative Impact of Teacher Professional Development on Student-Centered Assessment Approaches

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Abstract

Although the benefits of Assessment for Learning (AfL) are well recognized, its use remains limited due to the prevailing dominance of summative assessment and insufficient teacher preparation. This study explores how in-service professional development supports the adoption of formative, student-centered assessment practices, based on the perceived changes reported by principals and middle managers. Using data from 400 Italian schools, it examines the impact of training duration, delivery method, trainer profile, and staff involvement. Findings indicate a perceived decline in the use of numeric grades and increased implementation of feedback, rubrics, and self- and peer-assessment—especially when training is sustained, involves high participation of school staff, and is delivered through blended or online formats.

Keywords: teacher professional development; assessment for learning; formative assessment.

1. Introduction

A sustainable and inclusive education system that promotes meaningful, lifelong learning—as envisioned by UN SDG 4—recognizes the central role of learning assessment, particularly Assessment for Learning (AfL), in fostering active engagement, self-regulation, and metacognitive skills in students (Stiggins, 2005; Wiliam, 2011). Extensive research highlights AfL's positive impact on student achievement, motivation, and self-efficacy. Meta-analyses confirm the effectiveness of formative practices such as descriptive feedback (Hattie & Timperley, 2007; Wisniewski et al., 2020) and self-assessment (Panadero et al., 2017) in significantly enhancing learning outcomes (Klute et al., 2017; Lee et al., 2020).

Despite its proven benefits, AfL implementation remains challenging. Barriers often stem from entrenched professional identities and traditional assessment mindsets (Laveault & Allal, 2016; Looney, 2017). Teachers who rely on summative approaches may lack a clear understanding of AfL and find it difficult to reconcile the two paradigms (Berisha, 2024; Carless, 2005; Heitink, 2016). Moreover, ambiguity about AfL's objectives can lead to superficial or inconsistent application in classrooms (De Luca et al., 2012). The approach is also demanding it requires ongoing planning, data collection, and personalized feedback—difficult to sustain, particularly in large classes (De Luca et al., 2012; Andersson, 2018). Finally, limited professional knowledge and low self-efficacy further inhibit teachers' confidence in applying AfL effectively (Baidoo-Anu, 2023).

While professional development is widely recognized as crucial for the effective implementation of AfL (De Luca, 2012), limited research has examined how training programs specifically address the barriers that hinder its adoption. This gap is further complicated by significant variability in the design and delivery of professional development initiatives, as well as by the lack of clear, shared definitions of formative assessment—factors that reduce coherence and limit comparability across studies (Pastore, 2023; Von Hagen, 2025). This study seeks to contribute to the field by investigating the impact of Teacher Professional Development on teachers' assessment practices, with a focus on transformative change—specifically, the shift from summative-oriented conceptions toward more formative, inclusive, and learning-centered approaches.

2. Theoretical background

Teacher Professional Development (TPD)—structured learning activities aimed at enhancing teachers' skills, knowledge, and instructional practices—is widely recognized as a key driver of educational quality and improved student outcomes (OECD, 2014; Darling-Hammond et al., 2017). Understanding the factors that shape its effectiveness is therefore essential for informing policy and designing impactful programs.

Effective teacher professional development (TPD) is defined as intentional, sustained learning that results in measurable improvements in both teaching practices and student outcomes (Darling-Hammond et al., 2017; Sims et al., 2021). Research on TPD typically addresses multiple interconnected domains, including teachers' emotional engagement, knowledge acquisition, shifts in beliefs, changes in instructional practices, and student achievement (Guskey, 2002; Desimone, 2009). Key theoretical models emphasize the interdependence of these dimensions in facilitating teacher change. Clarke and Hollingsworth's (2002) Interconnected Model portrays this process as iterative and dynamic, unfolding across four domains—personal, practice, consequence, and external—through ongoing cycles of reflection and action. In contrast, Guskey (2002) proposes a more linear progression, where changes in instructional practice lead to observable improvements in student learning, which then prompt shifts in teachers' beliefs.

Building on these frameworks, this study explores how TPD supports a shift from traditional summative assessment to more formative, learning-oriented approaches (Nitko & Brookhart, 2014; Harlen, 2007). At the core of this transition is Assessment for Learning (AfL), a constructivist model that uses ongoing evidence to inform instruction and support student progress (Wiliam & Leahy, 2014; Flórez & Sammons, 2013). AfL practices include co-defining learning goals and success criteria, designing tasks that elicit rich evidence of understanding, and delivering feedback that promotes

improvement (William, 2011; Hattie & Timperley, 2007). It also integrates peer and self-assessment to strengthen students' evaluative thinking, self-regulation, and motivation (Nicol & Macfarlane-Dick, 2006; Van der Kleij et al., 2015).

Research has identified key design principles that underpin effective TPD, often described as "core features" or "design elements" (Desimone, 2009; Sims & Fletcher-Wood, 2021; Richter, 2024). These include a strong content focus, active and collaborative learning aligned with adult learning theory, modeling of effective practices, expert support, feedback and reflection opportunities, and alignment between theory and classroom application. Additional components such as clarity, practical relevance, cognitive activation, structured goal setting, and support for planning and monitoring have been shown to foster meaningful and sustained teacher learning (Timperley et al., 2007; Richter, 2024). The mode of delivery has become a key factor in TPD effectiveness, especially with the rapid growth of digital learning accelerated by COVID-19. Online and blended professional development (oTPD) offer more flexible, scalable models. Early studies show positive effects on teacher motivation, self-efficacy, and student learning (Stavermann, 2025), but research has lagged behind this expansion, highlighting the need for clearer design guidelines and evidence-based strategies (Lay, 2020).

3. Methodology

The study is framed around the central research question: How do in-service teacher professional development programs influence the implementation of AfL practices? To address this, three sub-questions guide the inquiry: (1) To what extent do PD programs promote a shift from summative to formative, student-centered assessment practices? (2) How do these programs impact the enactment of core AfL strategies, such as formative feedback or self and peer assessment? (3) Which PD program characteristics—such as duration, delivery mode, trainer profiles, and active learning components—are most strongly linked to meaningful changes in assessment practices?

Aligned with the goals of exploratory research, this study seeks to generate hypotheses, refine conceptual frameworks, and inform future investigations (Stebbins, 2001; Swedberg, 2020). It investigates changes in student assessment practices resulting from teacher professional development initiatives independently implemented by Italian schools, capturing a variety of intervention models. The study employed a convenience sample of approximately 1,500 schools from the INDIRE Avanguardie Educative network—an association of institutions committed to pedagogical innovation and continuous professional growth (Nardi et al., 2024). Though not statistically representative, the sample was purposely selected for participants deeply engaged in school innovation, ensuring rich and relevant data. The study targeted school leaders and middle managers—such as department heads and assessment coordinators—as key informants, given their strategic roles in driving innovation, managing change, and supporting teacher learning (Day et al., 2010; Fullan, 2007; Avalos, 2011).

Data were collected online via a structured questionnaire on LimeSurvey between March and April 2023. Before full deployment, the questionnaire was pilot-tested with a small group of school leaders to ensure clarity, relevance, and validity (Creswell, 2014). The survey comprised 30 closed-ended questions organized into four sections: school context and features of training initiatives; training objectives and perceived needs; impacts on teachers' assessment literacy and practices; and self-reported changes in formative assessment practices before and after training. Items addressed training types (lectures, workshops, mentoring), delivery modes (in-person, online, blended), target audiences (teachers, students, families), and training goals (enhancing formative feedback, self- and peer-assessment, and validity of assessment tools).

Quantitative analysis combined descriptive and inferential methods to explore how PD affects school assessment practices. Descriptive statistics summarized school profiles, training formats and durations, trainer characteristics, and assessment strategies implemented pre- and post-training. Inferential analysis employed Pearson's Chi-square tests to examine associations between key categorical variables, including school level (primary vs. secondary), training duration, delivery mode, number of initiatives, teacher participation rates, trainer type, and assessment practices such as

rubrics, feedback, self-assessment, and peer assessment. Data processing was conducted using SPSS software.

4. Results

Out of 1,320 schools surveyed, 796 responded and 389 completed the questionnaire. The majority of responses were provided by school principals (60%), followed by deputy heads (14%), assessment coordinators (13.5%), and other middle management staff (12.5%). Over the three-year period examined, 77.5% of the schools in the sample participated in at least one training session on student learning assessment. Among these, 28% attended a single session, while 72% engaged in multiple sessions; notably, 66% participated in three or more training courses. More than half of the schools trained over half of their teaching staff, and more than a third of the institutions involved over 76% of their teachers in the training.

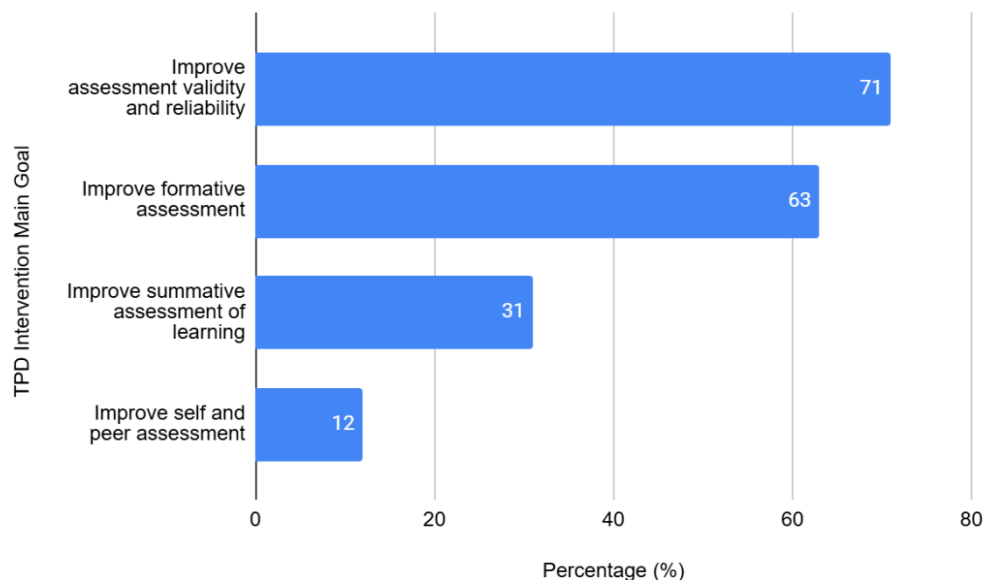


Fig 1: Teacher Professional Development main goals.

Teacher development goals focus on improving assessment validity and reliability (71%), strengthening formative strategies (63%), refining summative approaches (31%), and developing self- and peer-assessment (12%). Training duration varied, with 53% of schools offering sessions longer than 10 hours. Blended learning was the most common format (52%), followed by fully online training (37%), which was three times more frequent than face-to-face only (12%).

Trainers came from diverse institutional and professional backgrounds: university professors and researchers (31%), in-service teachers from the same school (29%), expert teachers from other schools (23%), and private agency trainers (20%). Additionally, 16% involved experienced teachers from professional networks. Lecture-based instruction was most common (61%), followed by workshops (50%) and action research (38%), highlighting a focus on reflective, practice-based approaches. The trainer's profile strongly influenced training strategies- Mentoring and tutoring were overall less common (5%–7%) but tended to be associated with school-based trainers. ($p = 0.003$), whereas lectures predominated when university professors led the training ($p = 0.05$).

To evaluate the perceived impact of the teacher training, respondents were asked to rate the prevalence of selected learning assessment strategies using a four-point Likert scale: Not at all, A little, To some extent, and A great extent. Figure 2 displays the aggregated percentages corresponding to the 'To some extent' and 'A great extent' response categories.

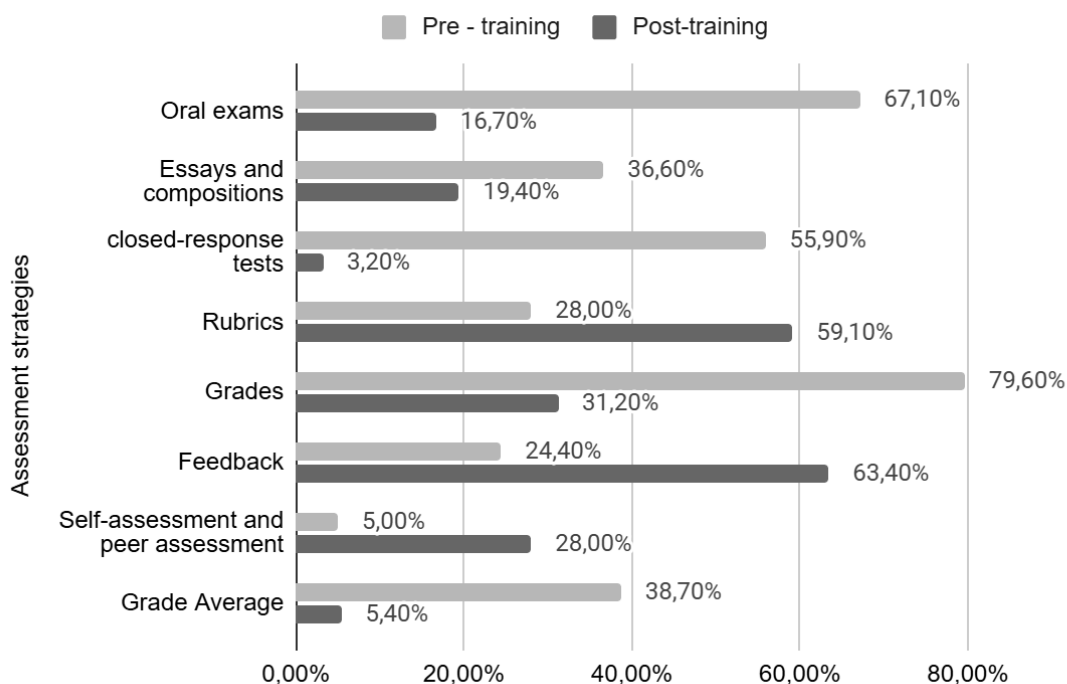


Fig. 2: Changes in Learning Assessment Strategies Before and After Participation in Professional Development

Overall, the data reveal clear shifts in assessment practices following the training. Summative tools such as grades and grade averages declined sharply, with grades dropping from 76% to 27.6%—a decrease of 48.4 percentage points. In contrast, formative and alternative strategies saw notable increases: rubrics more than doubled (from 28.0% to 59.1%), feedback rose by 39 points, and self-/peer assessment increased by 23 points. These trends indicate a move toward more formative, reflective, and student-centered practices, and suggest an evolving balance between traditional and innovative assessment approaches.

The study examined how training duration, delivery mode, and trainer profile relate to reported changes in assessment practices, revealing statistically significant associations. Schools with multiple training cycles showed a sharper decline in the use of numeric grades (from 34% to 8%, $p = 0.015$) and a corresponding increase in descriptive feedback (78%, $p = 0.050$). Additionally, a higher proportion of trained teachers was linked to reduced use of numeric grades (from 43% to 28%, $p = 0.046$), suggesting that broader staff participation contributes to more formative assessment approaches. The mode of training delivery appears to influence the extent to which certain assessment practices are adopted or abandoned. With respect to the use of numeric grades in ongoing assessment, schools that engaged in blended or online training reported a reduction of over 40% in their use, compared to only a 20% reduction among those that conducted face-to-face training. Similarly, schools that participated in face-to-face training reported an increase of +25.5% in the use of formative feedback, while those in blended and online formats showed greater gains: +34.1% and +38.3%, respectively.

Although self-assessment (SA) and peer-assessment (PA) were goals in only 19 cases, they were adopted by 93 schools (24%), suggesting TPD triggered broader reflective processes, making these strategies secondary outcomes. Among these 93 schools, training mode significantly influenced shifts, with blended learning used in 57% of SA/PA cases and fully online in 36.6%. In contrast, face-to-face (F2F) formats accounted for only 6.4% of these cases—substantially lower than the 12% recorded across all training initiatives. This pattern suggests a growing preference for flexible, accessible learning environments that support innovative, participatory assessment approaches. Differences also emerged based on trainer profile and audience composition: SA and PA were more

often included in programs led by university-affiliated educators or in-school teachers. These findings underscore the importance of delivery mode and training design in adopting reflective, student-centered assessment. However, due to the small number of SA/PA cases in face-to-face training (6.4% vs. 12% overall), it remains unclear if differences are statistically significant or reflect sample size limits.

5. Conclusion

This study investigates how teacher professional development (TPD) impacts the adoption of Assessment for Learning (AfL) across approximately 400 Italian schools, offering initial insights into key factors that can enhance formative assessment training. The data indicate a pronounced shift towards more formative, student-centered assessment practices following professional development programs, with a significant reduction in the use of summative tools such as grades and a marked increase in formative feedback, rubrics, and self- and peer-assessment. Research findings hold particular significance in the Italian context, where the adoption of self- and peer-assessment remains comparatively limited, with fewer than 30% of teachers employing these methods relative to the 42% international average (OECD-TALIS, 2018; Agrusti, 2023).

The study shows that longer and multiple training sessions significantly enhance the adoption of formative assessment. Schools with over 20 hours of training saw greater shifts from numeric grading to descriptive feedback and student-centered methods. Broader teacher involvement is also linked to stronger changes, aligning with Guskey's (2002) view that effective professional development involves gradual, collaborative change guided by clear goals and ongoing evaluation. Future research should explore how these principles translate into lasting systemic improvements.

The study finds that blended and fully online professional development are more effective than face-to-face training in promoting formative feedback and reducing numeric grading. Schools using digital formats showed greater shifts toward student-centered assessment, including increased self- and peer-assessment. These results align with evidence supporting the benefits of online learning in teacher development (Lay, 2020; Stavermann, 2025).

The study's generalizability is limited by a non-representative sample and reliance on school leaders' perspectives rather than teachers', underscoring the need for larger, teacher-centered research. The sample, drawn mainly from innovative schools, introduces self-selection bias and limits its representativeness of the broader Italian system. Nonetheless, it enables exploratory analysis across diverse contexts and provides a valuable foundation for further investigation into how contextual factors shape outcomes. Given the current scarcity of research on the role of context—such as school environment and teacher motivation—in influencing professional development effectiveness (Lay et al., 2020; Stavermann, 2025), future studies should specifically address these gaps to deepen understanding and inform more tailored interventions.

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