

Fruitful hybridisations and formative assessment: an integrated model to enhance learning in schools

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Abstract: The concept of fruitful hybridisation constitutes an epistemological paradigm capable of reconciling technological and pedagogical innovation, redefining assessment processes according to the principles of greater equity, significance, and educational value. Assessment conceived as 'fruitful hybridisation' represents an innovative pedagogical perspective that recognizes the essential need to integrate different approaches, tools, methodologies, and assessment contexts. This vision aims to overcome rigid and linear models, promoting assessment processes characterized by adaptive flexibility in response to the complexity of learning pathways and the diverse cognitive, relational needs of students. This study aims to analyse the empirical results of a survey conducted on course participants who completed the specialisation course for support teaching at the University of Catania. The analysis of the data obtained through the administration of a structured questionnaire QAPD (Trinchero, Piacenza, 2022) provides substantial insights into the assessment dynamics that characterize educational contexts, demonstrating how fruitful hybridisation is an effective construct for addressing complex assessment challenges. The processing and interpretation of the collected data allow us to trace a multidimensional profile of assessment practices, offering concrete operational guidelines for responding effectively to school inclusiveness.

Keywords: fruitful hybridisations, inclusive teacher, formative assessment, school inclusion

1. Introduction

The evolution of the teacher from a mere transmitter of disciplinary content to a mediator of meaningful learning represents one of the most significant challenges in contemporary pedagogy. In this context, the construct of 'fruitful hybridisation' refers to the possibility of integrating and creating dialogue between different forms of knowledge, tools, and languages in response to the complexity of today's education, generating new forms of knowledge and innovative didactic practices capable of promoting inclusive and personalised processes. The effective implementation of hybrid didactic models requires the mastery of specific skills for integrating face-to-face and distance learning, as highlighted in studies on methodological frameworks for blended didactics (Bonaiuti & Dipace, 2021). This transition requires the development of meta-professional competencies that enable teachers to critically cross-examine their own practices, systematically analyse educational processes, and



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implement evidence-based teaching strategies oriented towards the educational success of all students (Striano, 2001; Fabbri, 2007; Montalbetti, 2005).

In this context, reflexivity emerges as an essential epistemological device for constructing professional knowledge and for innovating educational methodologies, configuring itself as an action-research process that transforms the teaching experience into a laboratory of pedagogical experimentation. This transformative perspective inscribes itself within the broader paradigm of educational sustainability, which recognises the necessity of educating within changes through managing educational transitions between fragility and opportunity (Iavarone, 2022).

Formative assessment distinguishes itself as a central practice of contemporary pedagogy, aiming at the continuous improvement of learning and teaching processes through constant feedback and participatory strategies. It does not limit itself to certifying results, but accompanies the daily progress of students and teachers, promoting autonomy and the development of awareness. Supporting this perspective, the construct of 'fruitful hybridisations' offers a powerful methodological and epistemological key to integrating different approaches, languages, and tools: from narrative practices to digital instruments, from disciplinary knowledge to transdisciplinary contaminations. This paradigm enables the generation of rich, flexible, inclusive learning and assessment environments. Fruitful hybridisations, therefore, represent a prerequisite for a laboratory school that transforms assessment from a conclusive moment into a generative process, valuing the plurality of experiences and teaching strategies.

2. Presentation of the research design: objectives, research questions and sample

Empirical research on teaching proficiency (Amemasor, 2025; Viganò, 2025; Mulè and Gulisano, 2024; Marzano, 2021; Ricciardi, 2021; Dipace, 2019) highlights how formative assessment does not simply represent a methodological alternative to summative practices but constitutes a complex paradigm that integrates multiple dimensions of educational action through processes of 'fruitful hybridisation'.

The theoretical framework of this contribution is founded on the construct of 'fruitful hybridisations' as an interpretative paradigm of contemporary educational complexity. The study aims to investigate the implementation levels of perceived and declared assessment practices by teachers within the integrated system of "fruitful hybridisations", identifying four complementary dimensions of professional competence:

1. Hybrid design: integrating cognitive disciplinary objectives with the enhancement of transversal skills
2. Hybrid feedback: formative feedback both in groups and individually
3. Hybrid personalisation: integration between didactic-disciplinary planning and specific adaptations
4. Hybrid inclusion: synergy between skills assessment and personalized didactic intervention.

The survey adopts a cross-sectional quantitative-descriptive survey design, aimed at analysing professional practices using standardised indicators.

For data collection, the QAPD questionnaire (Piacenza, Trinchero, 2022) was used.

It is structured in a logical progression that begins with the collection of participants' demographic and professional data, then subsequently focuses on the central constructs of this survey.

The research sample considered is a convenience sample, non-probabilistic and accidental, since the selection of participants did not involve control procedures (Trinchero, 2022). It consists of n=465 services teachers at educational institutions of different levels within the education system who attended the Specialisation Course for Support teaching in the academic year 2024-2025, organised by the University of Catania. The sample presents variations in the number of respondents per single item (range: n=241-465) due to the professional specificity of certain educational practices. Quantitative data analysis was performed using JsStat v.2.01 statistical analysis software (Trinchero, 2015). This contribution presents only a few selected items related to the construct of fruitful hybridisations.

2.1. Hybrid Design. Item N: Propose specific activities to improve pupils' emotional and relational skills

Table 1. Item N "Frequency Indices". Sample Tfa Sostegno, University of Catania

Modality	Simple Frequency	Simple %	Cumulative Frequency	Cumulative %	Confidence Interval (CI) 95%
Fully effective	329	71%	329	71%	67%-75%
Only partially effective	129	28%	458	28%	24%-32%
In difficulty	7	2%	465	100%	0%-3%

In the analysis of data relating to Item N “*Proposing specific activities to improve students' emotional and relational skills*” in relation to hybrid design, 71% of teachers declare proposing fully effective interventions (95% confidence interval 67%-75%), whilst 28% judge them partially effective (95% confident interval 24%-32%) and only 2% report situations of difficulties (95% confident interval 0%-3%). Teachers assert that hybrid design represents an effective, innovative pedagogical strategy capable of overcoming the traditional separation between disciplinary knowledge and transversal competencies, creating an integrated approach that improves both educational dimensions. As a matter of fact, implementing hybrid planning requires teachers to arrange didactic pathways that combine, on the one

hand, deepening disciplinary content and, on the other, acquiring metacognitive and socio-relational abilities, using active methodologies that allow students to develop and generalise specific knowledge in other learning contexts as well.

Faced with $n=7$ participants declaring they perceive themselves as having difficulties at the efficacy level, in the open-ended responses, 77 report difficulties categorised as follows:

- Difficulty for students in exposing themselves
- Lack of experience on the teacher's part
- Poor emotional management by the teacher towards students
- Time management regarding didactics
- No difficulties

2.2. *Hybrid Assessment. Item X: Propose specific activities to assess students' meaningful acquisition of learning content*

Table 2. Item X. "Frequency Indices". Sample Tfa Sostegno, University of Catania

Modality	Simple Frequency	Simple %	Cumulative Frequency	Cumulative %	Confidence Interval (CI) 95%
Fully effective	282	65%	282	63%	59%-62%
Only partially effective	148	33%	430	97%	29%-38%
In difficulty	15	3%	445	100%	2%-5%

Analysis of data relating to item X, "*Proposing specific activities to assess pupils' meaningful acquisition of learning content*", reveals the following picture: 65% of teachers (95% confidence interval: 59%-62%) declare "fully effective" the possibility of proposing specific activities to assess meaningful acquisition of disciplinary content, whilst 33% consider this practice to be only partially effective (95% confidence interval: 29%-38%) and a residual proportion (3%) declare themselves in difficulty (95% confidence interval: 2%-5%). This configures a panorama that highlights consolidated assessment practices. However, analysis of the distribution shows that 96% of teachers are at positive competency levels, indicating a solid basis for implementing innovative assessment strategies in hybrid teaching. Faced with $n=19$ people feeling difficulties at the efficacy levels, in open-ended responses, $n=65$ report difficulties categorised as follows:

- Lack of experience on the teacher's part
- Lack of interest and motivation on the student's part

- Lack of time
- Activities that are too complex for students
- Difficulty defining cognitive processes
- No difficulties

2.3. Hybrid Feedback. Item U: *Explain to individual students in a personalised way what they got wrong in the tests and how they should have done them correctly*

Table 3. Item U. “Frequency Indices”. Sample Tfa Sostegno, University of Catania

Modality	Simple Frequency	Simple %	Cumulative Frequency	Cumulative %	Confidence Interval (CI) 95%
Fully effective	343	75%	343	75%	71%:79%
Only partially effective	104	23%	447	98%	19%:27%
In difficulty	8	2%	455	100%	0%:3%

Analysis of data relating to the hybrid feedback reveals a picture of substantial effectiveness: 75% of teachers (95% confidence interval: 71%-79%) declare themselves fully effective in the possibility of being able to explain in a personalised manner to individual students what they got wrong in tests and how they should have proceeded correctly, 23% consider this practice only partially effective (95% confidence interval 19%-27%) and a small quota 2% asserts themselves in difficulty (95% confidence interval 0%-3%). Hybrid feedback configures itself as a multidimensional assessment modality that systematically combines collective and personalised formative interaction. It integrates the social dimension of learning with the individual dimension, allowing students to benefit both from peer comparison and from specific feedback on their own performance. Faced with n=8 people reporting feeling difficulties in terms of effectiveness, in the open-ended responses, n=71 report difficulties categorised as follows:

- Lack of experience on the teacher’s part
- Too time-consuming
- Not hurting the student’s sensitivity
- Dealing with students who do not accept mistakes
- No difficulties

2.4 Hybrid inclusion. Item AO: Carry out targeted activities to promote the inclusion of students with cognitive-relational difficulties

Table 4. Item AO. "Frequency Indices". Sample Tfa Sostegno, University of Catania

Modality	Simple Frequency	Simple %	Cumulative Frequency	Cumulative %	Confidence Interval (CI) 95%
Fully effective	307	69%	307	69%	64%: 73%
Only partially effective	132	29%	132	29%	25%: 34%
In difficulty	8	2%	455	100%	0%:3%

The quantitative analysis of Item AO "*Carrying out targeted activities to promote the inclusion of students with cognitive-relational difficulties*" highlights statistically significant results that confirm the theoretical and operational solidity of the hybrid inclusion construct: in the sample of n=448 teachers, 68.5% (95% confident interval: 64%-73%) declared themselves fully effective, 29.5% judge themselves partially effective (95% confident interval: 25%-34%) and only 2% claimed to have difficulties (95% confident interval: 1%-3%), resulting in an asymmetric distribution towards positive effectiveness (98% favourable scores) with low variability and restricted confidence intervals that attest the high reliability of the estimate. These data converge with the theoretical framework of hybrid inclusion, born from the methodological fusion of physical and virtual environments, through the integration of network technologies, active and participatory teaching approaches, and innovative organisational strategies. The hybrid inclusion model, supported by technological infrastructures and teaching methodologies based on the principles of Universal Design for Learning, ensures systematic involvement and active participation of all students regardless of their cognitive-relational characteristics, converting diversity from an educational criticality into pedagogical capital through the creation of universally accessible learning contexts that go beyond the paradigm of retrospective adaptation to adopt an ecological and systemic perspective of school inclusion.

3. Discussion of results

Results from the monivariate analysis on selected *items* of the hybrid model provide a detailed picture of the relationship between declared didactic skills and implemented practices that raise some fundamental pedagogical questions for the debate on teacher professionalism. The data show high levels of perceived self-efficacy in all investigated

dimensions, with percentages ranging from 58% to 75% for the “fully effective” category. Analysis of professional competency perception is interpreted considering the construct of self-efficacy in socio-cognitive theory, as a theoretical lens for understanding the association between beliefs and practice implementation, whilst noting that the adopted items measure task-specific self-efficacy and do not constitute a reproduction of standardised scales of *teacher self-efficacy* (Bandura, 1977; Tschannen-Moran, M., & Woolfolk Hoy, A., 2001). In data analysis, a further significant *datum* emerges high self-efficacy does not always correspond to adopt didactic practice. This misalignment suggests that competency declared by teachers is often constructed through episodic experiences of success, without necessarily translating into a structured professional habitus. This analysis reveals *differentiated patterns* that reflect the tensions of teaching expertise in the knowledge society. Practices of enhancing emotional-relational skills (Item N) and personalised *feedback* (Item U) emerge as areas of strength, with high frequencies and consolidated self-efficacy. This *datum* confirms the evolution of the professional profile towards facilitation and personalised support skills consistent with pedagogical models centred on Learner Agency. The results for item X (hybrid assessment) indicate a prevalence of “*monthly frequency*”, suggesting that the assessment is still designed episodically as a distinctive moment in the teaching process. As pointed out by Wiliam and Leahy (2015), the systematic integration of formative assessment in classroom activities (*assessment-embedded*) represents one of the most effective pedagogical strategies for promoting learning and continuous improvement. Results relating to item AO (hybrid personalisation) highlight a significant critical issue in the implementation of the hybrid model, suggesting that competence is still in a consolidation phase. This pattern reflects the intrinsic complexity of educational personalisation, which requires not only advanced technological abilities, but also the capacity to analyse individual training needs in a differentiated approach and to design learning objectives flexibly. This *datum* is particularly relevant when interpreted in light of the principles of Universal Design for Learning (UDL) and theories on differentiated instruction (D'Alonzo, 2021). As a matter of fact, personalisation of objectives represents a critical aspect of teaching professionalism, requiring integration of assessment skills, adaptive curriculum design, and the management of personalised learning.

The educational challenge consists of promoting an evaluative competence that conceives assessment as an integral part of the teaching process, coherently with *assessment for learning* principles. Technological and methodological hybridisation can function as a true catalyst for this transition, facilitating continuous forms of monitoring and feedback. The results suggest that didactic hybridisation does not represent merely a simple superimposition of techniques and methodologies but requires a reconfiguration of professional expertise. Areas of greater success (emotional-relational enhancement, personalised *feedback*) share characteristics of relational immediacy and tangible evidence of impact, while the

most problematic ones (formal personalisation, systematic assessment) require know-how of multifaceted design skills and management of considerably longer timeframes. From a pedagogical point of view, the necessity emerges to conceptualise hybridisations as integrated professional skills that combine technical, relational, and reflective dimensions. Teacher training should therefore orient itself towards situated professional learning models that promote the acquisition of hybrid skills through guided experimentation and critical self-analysis of teaching practices. Teachers' declared difficulties in their open-ended responses outline a problematic picture that highlights how teachers recognise training gaps in their professional experience for assessing meaningful acquisition of learning content, confirming the necessity of targeted training courses. They also report students' lack of interest and motivation as a further obstacle to improving effective assessment strategies. At the same time, temporal deficiency emerges in teaching organisation: teachers manifest difficulties in managing time; they declare the need to implement an effective, structured, and flexible planning. Finally, a particularly significant critical issue emerges in the difficulty of defining the cognitive processes underlying meaningful learning, revealing dimensions in the theoretical understanding of assessment mechanisms and the cognitive dimensions to observe and assess. Teachers' statements confirm their awareness of receiving training support, both on the methodological plane and practical-operational ones, for the effective implementation of innovative assessment strategies in a hybrid design.

4. Conclusions

The findings of this research study depict a teaching profession in transition, distinguished by strong interpersonal and motivational competencies, yet remaining fragile in systemic and procedural dimensions. Declared and perceived self-efficacy, although recognised as an important resource in accordance with Bandura's socio-cognitive theory (1997), must be supported by training tools that enable the transition from situational competence to expertise transferable across different learning contexts.

Didactic hybridisation configures itself not as a mere technical objective, but as a professional development paradigm that requires the combined recomposition of disciplinary knowledge, pedagogical skills, technological abilities and reflective capacities, in line with what Tschannen-Moran and McMaster (2009) highlighted regarding sources of professional self-efficacy, and only through this integration will it be possible to transform episodic practices into expert professional *habitus*, capable of responding to the personalisation and inclusion challenges in the knowledge society (Striano, 2001; Fabbri, 2007).

Empirical evidence suggests the need to rethink initial and continuing teacher training curricula, orienting them towards situated professional learning models that promote acquisition of hybrid skills through guided experimentation and critical analysis of teaching practices, with particular attention to the development of meta-evaluative proficiencies,

following the principles of assessment for learning theorised by Black and Wiliam (2009), which enable teachers to understand and implement integrated assessment processes, overcoming the breakup between diagnostic, formative and summative assessment.

Future research developments should conduct longitudinal studies that can trace the evolution of hybrid skills in teachers during their professional development. “Fruitful hybridisations” require systemic support that goes beyond individual teacher training, involving the entire school organisation in cultural and methodological innovation processes. As highlighted in studies on professional development models based on effectiveness (Bray-Clark & Bates, 2003), through educational policies that support the creation of professional learning communities, where teachers can collaboratively experiment with innovative practices following the cyclical model of self-regulation proposed by Zimmerman (2002). Furthermore, investment in educational technologies should be accompanied by in-depth pedagogical reflection on models of educational integration, favouring the adoption of solid theoretical frameworks such as Universal Design for Learning and the principles of assessment for learning theorised by Wiliam and Leahy (2015).

The construct of “fruitful hybridisations” reveals itself promising for interpreting and orienting the evolution of teacher professionalism in the contemporary context, characterised by increasing complexity and uncertainty, in line with the principles of Deweyan democratic education, requiring the development of a more articulated theory that considers not only the methodological dimension, but also the epistemological and cultural dimensions, exploring how the integration of different knowledge and practices can contribute to the formation of competent citizens for 21st-century society. In line with Zimmerman's vision of self-regulated learning and formative assessment processes (Li et al., 2024), an interdisciplinary dialogue involving pedagogists, psychologists, sociologists, and educational technology experts in a common project of research and innovation, which addresses the challenges of sustainability and educational equity. This involves developing implementation models that can also be adopted in contexts characterised by limited resources and high socio-cultural diversity, following the principles of inclusiveness theorised by Bandura (1997) in his theory of collective self-efficacy. Realising the transformative potential of “fruitful hybridisations” in improving the quality of education and promoting the educational success of all students.

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