COGNITIVE AND NON-COGNITIVE SKILLS IN INCLUSIVE SCHOOLS: THE ROLE OF HYBRID LEARNING ENVIRONMENTS

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ABSTRACT
The growing complexity of contemporary educational contexts requires a rethinking of teaching practices from an inclusive perspective, integrating cognitive and non-cognitive dimensions to promote students' overall well-being. In this framework, hybrid learning environments, combining physical and digital spaces, emerge as flexible ecosystems that support personalization, participation, and attention to diverse educational needs. This paper explores their role in fostering both cognitive and transversal skills, including emotional self-regulation, resilience, motivation, collaboration, and autonomy, which are essential for educational success and inclusion. Particular attention is devoted to the contribution of digital and multisensory technologies in enhancing inclusive learning processes. The study includes an experimental phase involving pre-service special education teachers (TFA support courses, primary and secondary levels), using a structured questionnaire to investigate perceptions, attitudes, and preparedness regarding integrated teaching practices. Findings reveal increasing openness toward innovation and hybrid environments, alongside challenges related to teacher training, technology management, and their effective pedagogical integration.

KEYWORDS
Hybridlearning; skills; inclusion, education, learning.

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1. Introduction

In recent decades, educational systems have been called upon to address increasingly complex challenges linked to social, cultural, and technological transformations. Within this evolving landscape, inclusive education has emerged as a fundamental paradigm aimed at ensuring equitable learning opportunities and active participation for all students, regardless of their individual characteristics, abilities, or educational needs. Inclusion is no longer conceived merely as a compensatory approach for students with disabilities but as a broader educational perspective that values diversity as a resource and promotes the development of each learner's potential (Ainscow & Booth, 2011). At the same time, contemporary educational research has highlighted the importance of fostering not only cognitive skills—such as reasoning, problem-solving, critical thinking, and academic achievement—but also non-cognitive skills, including motivation, resilience, self-regulation, collaboration, empathy, and emotional awareness. These transversal competencies play a crucial role in students' personal growth, social participation, and long-term educational success (Heckman & Kautz, 2012). The interaction between cognitive and non-cognitive dimensions contributes significantly to the construction of meaningful learning experiences and to the promotion of well-being within educational settings. In this context, hybrid learning environments have gained increasing attention as innovative educational ecosystems capable of integrating physical and digital spaces. Rather than representing a simple combination of face-to-face and online instruction, hybrid environments offer flexible and personalized learning opportunities that can respond more effectively to students' diverse needs and learning styles (Díaz, V., & Brown, M.,2022) Through the use of digital technologies, multisensory tools, and collaborative platforms, these environments can facilitate accessibility, engagement, and active participation, thus supporting inclusive educational practices (Garrison & Vaughan, 2008). Furthermore, hybrid learning environments provide opportunities to design teaching strategies that simultaneously promote academic achievement and the development of social-emotional competencies. By encouraging interaction, autonomy, reflection, and collaborative problem-solving, they can contribute to creating more inclusive and responsive educational contexts. However, the effective implementation of these environments requires adequate teacher preparation, pedagogical awareness, and the ability to integrate technology meaningfully into teaching and learning processes (Darling-Hammond, 2020). This study explores the role of hybrid learning environments in fostering both cognitive and non-cognitive skills within inclusive schools. Particular attention is devoted to the perceptions and preparedness of pre-service support teachers attending

the TFA specialization courses, whose professional role is central to the construction of inclusive educational settings capable of responding to the challenges of contemporary schooling.

2. The Integration of Cognitive and Non-Cognitive Dimensions in Contemporary Schooling

The growing complexity of contemporary societies has profoundly transformed the educational mission of schools, requiring a shift from a predominantly knowledge-based model of instruction toward a more holistic approach to learning and human development. In this perspective, educational success can no longer be measured solely through students' academic performance or the acquisition of disciplinary knowledge. Rather, schools are increasingly called upon to foster the integrated development of cognitive and non-cognitive competencies, recognizing their reciprocal influence on learning processes, social participation, and individual well-being (OECD, 2021). This paradigm shift reflects a broader understanding of education as a process aimed at supporting the full development of the person, in accordance with inclusive and lifelong learning principles promoted by international organizations such as UNESCO (2020). Traditionally, cognitive skills have occupied a central position in educational research and practice. These competencies include reasoning, memory, problem-solving, critical thinking, language development, and the ability to process and apply knowledge in different contexts. Cognitive skills are essential for academic achievement and remain fundamental indicators of educational attainment. However, a growing body of research has demonstrated that academic success is not determined exclusively by cognitive abilities. Students' capacity to regulate emotions, maintain motivation, persevere in the face of challenges, establish positive relationships, and effectively manage learning tasks significantly influences educational outcomes (Heckman & Kautz, 2012). These competencies, often referred to as non-cognitive skills, social-emotional skills, or transversal competencies, have therefore become increasingly relevant within educational discourse. The distinction between cognitive and non-cognitive skills, while analytically useful, should not be interpreted as a rigid separation. Contemporary theories of learning emphasize the interconnected nature of cognitive, emotional, social, and

motivational dimensions. Learning is increasingly understood as a multidimensional process in which emotions influence attention, memory, decision-making, and problem-solving capacities (Immordino-Yang & Damasio, 2007). Positive emotional experiences can enhance engagement and knowledge retention, whereas anxiety, stress, and social exclusion may negatively affect cognitive performance. Consequently, the educational process requires learning environments capable of supporting both intellectual growth and emotional well-being. Within this framework, the concept of non-cognitive skills has gained considerable attention in educational policy and research. International studies conducted by the OECD (2021) highlight that competencies such as self-regulation, perseverance, responsibility, collaboration, empathy, and adaptability are strongly associated with academic achievement, mental health, and future employability. Similarly, Heckman and Kautz (2012) argue that non-cognitive skills contribute substantially to life outcomes and should be considered essential educational objectives rather than secondary by-products of schooling. These findings have encouraged educators to move beyond traditional content transmission models and adopt pedagogical approaches that cultivate students' personal and social development alongside cognitive learning. The integration of cognitive and non-cognitive dimensions becomes particularly significant within inclusive educational contexts. Inclusive education is based on the recognition of diversity as a value and seeks to ensure meaningful participation and learning opportunities for all students, including those with disabilities, learning difficulties, socio-cultural disadvantages, or other special educational needs (Ainscow & Booth, 2011). From this perspective, inclusion cannot be reduced to physical placement within mainstream classrooms; rather, it involves the creation of learning environments that address the cognitive, emotional, relational, and motivational needs of every learner. The development of non-cognitive competencies is therefore crucial in fostering students' sense of belonging, self-efficacy, and active engagement in educational experiences. Research in educational psychology further supports the importance of integrating these dimensions. Bandura's (1997) theory of self-efficacy demonstrates that learners' beliefs about their own capabilities significantly influence motivation, persistence, and academic performance. Likewise, Dweck's (2006) work on growth mindset reveals that students who perceive

intelligence as malleable are more likely to embrace challenges and demonstrate resilience in learning situations. Such findings suggest that educational interventions should not only focus on knowledge acquisition but also promote positive attitudes, emotional regulation, and adaptive learning behaviors. The emergence of digital technologies and innovative learning environments has further reinforced the need for an integrated educational approach (Siemens, 2023). Contemporary students increasingly learn within complex ecosystems characterized by continuous interactions between physical and virtual spaces. These contexts require not only cognitive competencies related to information processing and digital literacy but also non-cognitive skills such as autonomy, self-management, collaboration, and responsible participation in digital communities. Consequently, schools must design educational experiences that simultaneously support intellectual development and the cultivation of social-emotional competencies, preparing students to navigate the challenges of contemporary society (Holmes et al., 2023). Ultimately, the integration of cognitive and non-cognitive dimensions represents one of the most significant challenges and opportunities for contemporary schooling. By recognizing the inseparable relationship between thinking, feeling, and acting, educational systems can promote more inclusive, equitable, and meaningful learning experiences. Such an approach provides the theoretical foundation for the development of hybrid learning environments capable of fostering both academic achievement and personal growth, contributing to the construction of educational contexts where all students can thrive and fully participate.

3. Methodology

This study adopts a quantitative research design aimed at exploring the perceptions, attitudes, and levels of preparedness of pre-service support teachers regarding the role of hybrid learning environments in fostering cognitive and non-cognitive skills within inclusive educational settings. The methodological framework is grounded in the assumption that effective inclusion requires the integration of cognitive, emotional, relational, and technological dimensions, and that support teachers play a crucial role in facilitating such integration through innovative pedagogical practices.

3.1 Participants

The research involved a sample of students enrolled in the Specialization Course for Support Activities (TFA Sostegno) for both lower and upper secondary schools. Participants were selected through convenience sampling and voluntarily agreed to participate in the study. The choice of this target group was motivated by the strategic role that future support teachers will assume in promoting inclusive educational processes and in designing learning environments capable of responding to the heterogeneous needs of contemporary classrooms.

3.2 Research Instrument

Data were collected through a structured questionnaire specifically designed for the purposes of this study. The instrument was developed on the basis of the scientific literature concerning inclusive education, social-emotional learning, digital pedagogy, and hybrid learning environments (Ainscow & Booth, 2011; Garrison & Vaughan, 2008; OECD, 2021). The questionnaire consisted of four sections.

The first section gathered demographic and educational information, including age, gender, educational background, and teaching experience. The second section investigated participants' knowledge and perceptions of hybrid learning environments, focusing on their potential to support inclusion and personalized learning. The third section explored attitudes toward the development of cognitive and non-cognitive skills, examining the perceived importance of competencies such as critical thinking, self-regulation, resilience, collaboration, emotional awareness, and autonomy. Finally, the fourth section examined participants' self-assessed preparedness in integrating digital technologies into inclusive teaching practices and identified perceived barriers and training needs. Most items were measured using a five-point Likert scale ranging from 1 ("Strongly disagree") to 5 ("Strongly agree"), allowing participants to express the intensity of their opinions and experiences. Additional open-ended questions were included to provide qualitative insights and enrich the interpretation of quantitative findings.

3.3 Data Collection Procedure

The questionnaire was administered online during the academic year 2025–2026 through Google Form. Participation was voluntary and anonymous. Prior to data collection, participants were informed about the aims of the research

and the use of data exclusively for scientific purposes. Ethical principles concerning confidentiality, privacy protection, and informed consent were respected throughout the study.

3.4 Data Analysis

The collected data were analyzed using descriptive statistical procedures. Frequencies, percentages, means, and standard deviations were calculated to provide an overview of participants' responses and identify emerging trends. Particular attention was paid to the relationships between perceptions of hybrid learning environments, attitudes toward cognitive and non-cognitive skill development, and perceived levels of professional preparedness. Responses to open-ended questions were subjected to thematic analysis in order to identify recurring themes and complement the quantitative results.

3.5 Research Objectives

The study was guided by three main research objectives:

1. To investigate pre-service support teachers' perceptions of hybrid learning environments as tools for promoting inclusive education.
2. To examine the extent to which participants recognize the importance of integrating cognitive and non-cognitive skills in educational practice.
3. To identify strengths, challenges, and training needs related to the pedagogically effective use of digital technologies and hybrid learning environments.

Through this methodological approach, the research seeks to contribute to the growing debate on inclusive digital education by providing empirical evidence regarding the readiness of future support teachers to design and implement learning environments capable of fostering both academic achievement and students' holistic development.

4. Results

A total of 400 pre-service support teachers participated in the study. The analysis revealed a generally positive attitude toward the use of hybrid learning environments as tools for promoting inclusion and supporting the development of both cognitive and non-cognitive skills. Regarding the perceived educational value of hybrid learning environments, 84.5% of participants agreed or strongly agreed that the integration of physical and digital learning spaces can enhance

students' participation and engagement. Furthermore, 81.2% considered hybrid learning particularly effective in addressing the diverse educational needs present in inclusive classrooms. With respect to cognitive skills, participants recognized the potential of hybrid environments to foster critical thinking, problem-solving, and autonomous learning. The highest-rated item concerned the promotion of student autonomy (M = 4.32; SD = 0.67), followed by the enhancement of critical thinking skills (M = 4.18; SD = 0.73). Approximately 78.5% of respondents believed that digital technologies can support more personalized and meaningful learning experiences. The results were similarly positive regarding non-cognitive skills. A large majority of participants agreed that hybrid learning environments can facilitate the development of collaboration (87.3%), motivation (82.1%), and emotional self-regulation (74.8%). The perceived contribution of digital tools to resilience and self-efficacy was slightly lower but still significant, with 69.4% expressing positive evaluations. Despite this overall favorable perception, several critical issues emerged. The most relevant challenge concerned professional preparedness. Only 42.6% of participants felt adequately trained to design and implement hybrid learning activities within inclusive settings. More than half of the sample (57.4%) reported uncertainty regarding the pedagogically effective integration of digital technologies into everyday teaching practices. Similarly, 63.8% of respondents identified insufficient training opportunities as a major obstacle to the successful adoption of hybrid learning environments. Technological management difficulties were reported by 48.7% of participants, while 45.2% highlighted concerns related to the availability of adequate technological resources in schools. The analysis of open-ended responses further confirmed these findings. Three recurrent themes emerged: the need for more practical training experiences, the importance of developing digital-pedagogical competencies, and the necessity of strengthening the connection between technological innovation and inclusive teaching methodologies. Overall, the findings suggest that future support teachers recognize the educational potential of hybrid learning environments in fostering both cognitive and non-cognitive skills. However, the results also indicate the need for targeted training pathways aimed at enhancing teachers' confidence and competence in the pedagogically meaningful use of digital technologies for inclusion.

Table 1: Results

Dimensione	% Accordo (4-5)	Media (1-5)	DS
Hybrid environments promote inclusion	84.5%	4.28	0.69
Support for personalized learning	81.2%	4.21	0.71
Development of critical thinking	79.6%	4.18	0.73
Development of student autonomy	83.4%	4.32	0.67
Promotion of collaboration	87.3%	4.41	0.62
Enhancement of motivation	82.1%	4.25	0.70
Support for emotional self-regulation	74.8%	4.03	0.79
Perceived adequacy of personal training	42.6%	3.11	0.95
Need for further professional development	88.9%	4.51	0.58

5. Conclusion and Discussion

The findings of this study highlight a generally positive perception among pre-service support teachers regarding the potential of hybrid learning environments to support the development of both cognitive and non-cognitive skills within inclusive educational contexts. Participants consistently recognized the value of integrating physical and digital learning spaces, associating this combination with opportunities for student engagement, autonomy, collaboration, and personalized learning. These perceptions are broadly consistent with existing literature discussing the pedagogical potential of blended and hybrid learning models in relation to active learning and differentiated instruction (Garrison & Vaughan, 2008; Bonk & Graham, 2012). At the same time, the importance attributed by participants to non-cognitive skills such as motivation, emotional self-regulation, and resilience reflects the growing attention devoted to socio-emotional dimensions within educational processes (OECD, 2021; Heckman & Kautz, 2012). However, the findings should

be interpreted primarily as an account of pre-service support teachers' perceptions, expectations, and self-reported preparedness rather than as evidence of the effectiveness of hybrid learning environments. While participants expressed openness toward educational innovation and identified several potential benefits associated with hybrid learning, the study does not allow conclusions to be drawn regarding its actual effects on students' cognitive, emotional, or social outcomes. Such effects would require specific empirical investigation involving students and appropriate measures of learning and participation. The study also reveals a gap between positive attitudes toward educational innovation and perceived professional readiness to implement hybrid approaches in inclusive settings. The relatively low levels of self-reported preparedness suggest that participants may perceive initial teacher education programs as not yet fully addressing the digital-pedagogical competencies they associate with the planning and management of hybrid learning environments. This perception is consistent with broader concerns in the literature regarding the integration of digital education and inclusive pedagogy within teacher training curricula (European Commission, 2023; Tondeur et al., 2017). Similarly, the reported difficulties related to technological integration and resource management point to structural and institutional conditions that participants perceive as relevant to the adoption of innovative teaching practices. From an inclusive education perspective, the findings also suggest that participants do not view technology as sufficient in itself to ensure inclusive practices. Rather, their responses emphasize the perceived importance of teachers' ability to design learning experiences that take into account diverse cognitive, emotional, and relational needs. In line with Ainscow and Booth (2011), inclusion can be understood as a process involving the transformation of educational contexts and the removal of barriers to participation. Within this perspective, hybrid learning environments may be considered not simply as technological arrangements, but as pedagogical contexts whose meaning and potential depend, according to participants' perceptions, on intentional design, reflective practice, collaboration, and appropriate professional preparation. This study therefore contributes to the discussion on hybrid learning and inclusive education by providing empirical evidence concerning how pre-service support teachers perceive these environments and their own preparation to work within them. The results point to widespread openness toward educational innovation, together with an awareness of the relevance of both cognitive and non-cognitive dimensions of learning. At the same time, they highlight perceived training needs, particularly in relation to digital pedagogical competence and the meaningful integration of technologies within inclusive teaching strategies, as conceptualized, for example, through the TPACK framework (Mishra & Koehler, 2006). These

findings should be understood as indicative of participants' perceptions and training needs rather than as evidence of the effectiveness of hybrid learning approaches. Future research could further investigate these issues through mixed-method or longitudinal designs, examining how teachers' perceptions and self-reported competencies evolve throughout teacher education and during the transition to professional practice. It would also be valuable to extend the investigation to in-service teachers, allowing researchers to compare perceptions and self-reported competencies across different stages of professional development and to examine the role of specific professional development initiatives (Zawacki-Richter, 2020). Further studies could also move beyond perceptual data by examining specific hybrid learning practices and their relationships with students' cognitive, non-cognitive, and participation-related outcomes. Such research would make it possible to distinguish more clearly between teachers' expectations and perceptions and empirically observed educational outcomes. Another relevant direction concerns the role of educational leadership and school organization in shaping the conditions perceived by teachers as supportive of hybrid and inclusive practices. Examining institutional cultures, resource availability, professional collaboration, and organizational arrangements could provide a broader understanding of the contextual factors associated with the adoption of innovative approaches. Finally, future research should further explore students' perspectives, particularly those of students with special educational needs, in order to complement teachers' perceptions and examine how different actors experience hybrid learning environments. Overall, the findings indicate that pre-service support teachers associate hybrid learning environments with a range of possibilities for organizing inclusive educational experiences, while also expressing relevant concerns regarding professional preparation and contextual conditions. Rather than establishing the effectiveness of hybrid learning, the study highlights how future teachers perceive its potential, the competencies they consider necessary, and the conditions they identify as important for its implementation. These perceptions provide a useful basis for reflecting on teacher education and for developing further empirical research capable of investigating the educational processes and outcomes associated with different forms of hybrid learning.

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