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METHODS FOR FORMING MODERN META-SUBJECT COMPETENCIES IN PRIMARY SCHOOL STUDENTS

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Abstract: In the context of rapidly evolving global challenges and the increasing need for adaptable, lifelong learners, the development of meta-subject competencies in primary education has become an educational imperative. Meta-subject competencies—such as critical thinking, collaboration, creativity, and self-regulation—transcend individual disciplines and equip students with transferable skills necessary for future academic and personal success. This paper explores theoretical foundations and contemporary pedagogical strategies aimed at fostering these competencies in primary school settings. Through an extensive review of literature and critical discussion, the study highlights the importance of learner-centered approaches, teacher facilitation, socio-emotional learning, and the effective integration of technology. It further examines the challenges in assessing and institutionalizing such competencies, considering contextual variations and the need for systemic reform. The findings suggest that while the path to effective competency-based education is complex, holistic strategies that blend cognitive, emotional, and technological dimensions hold significant promise for developing well-rounded, future-ready learners.

Keywords: Meta-subject competencies, primary education, 21st-century skills, critical thinking, learner-centered pedagogy, digital learning, socio-emotional development, interdisciplinary learning, formative assessment, educational innovation.

Introduction. The transformation of education systems in the 21st century has led to a fundamental rethinking of what it means to be educated in an increasingly complex, interconnected, and technology-driven world. One of the most significant shifts in this regard is the growing emphasis on the development of meta-subject competencies—a set of overarching skills and cognitive strategies that enable learners to apply knowledge flexibly across a range of subject areas and real-life contexts. Unlike subject-specific competencies, which are confined to individual disciplines, meta-subject competencies (also referred to as transversal or cross-curricular competencies) encompass critical thinking, creativity, collaboration, self-regulation, communication, digital literacy, and the ability to engage in reflective and independent learning. The early development of such competencies is now widely recognized as essential, particularly within the framework of primary education. This stage in a child's development is not only critical for acquiring basic literacy and numeracy skills, but also for shaping the cognitive and social foundations that support future learning. Studies in developmental psychology (Bruner, 1966; Vygotsky, 1978) emphasize the importance of early social interaction, scaffolded learning, and guided exploration in constructing mental schemas that are transferable across contexts. In this sense, the primary school becomes a fertile ground for cultivating learning habits and thinking strategies that transcend the boundaries of traditional subjects.

The urgency to integrate meta-subject competencies into primary education is further amplified by global educational policy frameworks. For instance, the OECD's Education 2030 Framework outlines a vision of education that centers on the development of agency, adaptability, and global competence.

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Similarly, UNESCO advocates for curricula that prepare learners to meet global challenges such as climate change, digital transformation, and social inequality—challenges that require more than just knowledge; they demand complex problem-solving, empathy, cooperation, and ethical reasoning. Despite widespread agreement on the importance of meta-subject competencies, there remains a significant gap between policy aspirations and classroom implementation. Many educators face challenges in translating abstract competency frameworks into concrete teaching strategies, especially within the constraints of standardized curricula and assessment systems. Traditional models of instruction—often characterized by rote learning and teacher-centered approaches—are ill-suited to fostering the active, inquiry-based, and collaborative environments in which meta-competencies thrive.

In response to these challenges, a growing body of educational research has explored a variety of innovative methodologies for competency-based learning at the primary level. These include, but are not limited to, project-based learning (PBL), inquiry-based instruction, integrated thematic units, digital and game-based learning, formative assessment practices, and socio-emotional learning frameworks. Moreover, the integration of technology and the use of adaptive learning platforms have opened up new possibilities for personalized, competency-driven instruction that can respond to the diverse needs of young learners. This article seeks to explore and analyze the most effective and research-supported methods for forming modern meta-subject competencies in primary school settings. It aims to provide a comprehensive overview of theoretical foundations, pedagogical strategies, and practical examples that can guide educators, curriculum developers, and policymakers. By bridging the gap between theory and practice, the study aspires to contribute to a more holistic and future-oriented model of primary education—one that equips students not only with subject knowledge, but with the transferable skills and dispositions necessary for lifelong learning and responsible global citizenship.

Literature Review. The concept of meta-subject competencies, though relatively recent in educational discourse, has its roots in several well-established psychological and pedagogical theories. Scholars such as Jean Piaget (1972) and Lev Vygotsky (1978) laid the foundation for understanding how children construct knowledge not in isolation, but through interaction with their environment and social context. Vygotsky's notion of the "zone of proximal development" underscores the importance of guided learning and the social construction of knowledge, both of which are integral to the development of transferable cognitive skills that characterize meta-subject competencies.

Over the past two decades, meta-subject or transversal competencies have gained increasing attention from international educational organizations. The OECD (2018) identifies such competencies—including critical thinking, self-regulation, cooperation, and digital literacy—as essential for students to thrive in the unpredictable socio-economic landscapes of the future. Similarly, UNESCO (2015) highlights the importance of global citizenship education, which calls for the cultivation of values, knowledge, and attitudes that go beyond academic performance and encompass the capacity to act responsibly and reflectively in an interconnected world. Several empirical studies have examined how these competencies can be nurtured effectively at the primary education level. For example, Fullan and Langworthy (2014) advocate for “deep learning” approaches that emphasize six global competencies: character, citizenship, collaboration, communication, creativity, and critical thinking.

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These competencies are not taught as isolated skills but are embedded into content through rich learning tasks and student-led inquiry. According to their findings, when students are actively engaged in real-world problem-solving and interdisciplinary projects, they not only retain subject knowledge more effectively but also build a versatile skill set applicable across various life contexts.

Research by Darling-Hammond et al. (2020) supports the idea that socio-emotional learning (SEL) frameworks can be a powerful vehicle for cultivating meta-subject competencies, especially among younger learners. SEL programs such as CASEL emphasize skills like self-awareness, responsible decision-making, and relationship-building, which align closely with the aims of meta-subject education. In classrooms that prioritize emotional safety, inclusivity, and collaborative learning structures, students are more likely to take intellectual risks, reflect on their learning, and engage deeply with complex tasks. The integration of digital technologies into early education has also been identified as a means of enhancing meta-subject competencies. According to Voogt and Roblin (2012), digital tools—when used pedagogically rather than merely as delivery platforms—can facilitate exploratory learning, real-time feedback, and differentiated instruction. Interactive learning environments, such as educational games, simulations, and coding platforms, have been shown to foster problem-solving, logical reasoning, and adaptive thinking in young children.

In addition, curriculum reform initiatives in several countries have incorporated meta-subject learning objectives into national education strategies. For instance, Finland's National Core Curriculum for Basic Education (2014) explicitly includes "transversal competencies" as one of its central components, ensuring that every subject contributes to the development of holistic learner profiles. These competencies are woven into interdisciplinary themes such as sustainable development, well-being, and digital literacy, illustrating how content and skills can be integrated effectively in everyday teaching. Despite these advances, some scholars caution against the superficial implementation of competency-based education. Biesta (2009) warns that the emphasis on measurable outcomes can lead to the neglect of the more nuanced, affective, and dispositional dimensions of learning. There is also ongoing debate about how to assess meta-subject competencies in valid and reliable ways, especially in young learners whose developmental trajectories vary widely. As such, educators must carefully balance structured guidance with opportunities for autonomy and creativity, avoiding the risk of reducing complex competencies to checklists or rigid performance indicators.

The literature reflects a growing consensus on the importance of meta-subject competencies in preparing students for the demands of the 21st century. There is strong theoretical and empirical support for embedding such competencies within the fabric of primary education through integrated pedagogy, socio-emotional support, and innovative use of technology. However, successful implementation depends on the readiness of teachers, the flexibility of curricula, and the alignment of assessment practices with holistic educational goals.

Discussion. The integration of meta-subject competencies into primary school education marks a paradigmatic shift from content-centered pedagogy to learner-centered development. While theoretical frameworks and policy documents strongly advocate for the inclusion of such competencies, their practical realization within early educational settings reveals both promising

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potential and significant challenges.

One of the primary insights drawn from the literature is that effective development of meta-subject competencies requires a fundamental reorientation of instructional strategies. Traditional didactic models, which prioritize knowledge transmission and standardized assessment, often fail to engage students in the kinds of cognitive and collaborative tasks necessary for building critical thinking, adaptability, and self-regulation. As noted by Fullan and Langworthy (2014), when students are positioned as active agents in their own learning—through inquiry-based projects, cooperative learning, and real-world problem-solving—they not only acquire academic knowledge more deeply but also internalize the skills and dispositions that constitute meta-competency. A key theme emerging from this discourse is the role of the teacher as a facilitator of competence-oriented learning. In contrast to conventional roles of authority and content delivery, teachers must now adopt multifaceted roles—as designers of learning environments, mentors in socio-emotional growth, and curators of interdisciplinary content. This shift demands not only pedagogical innovation but also substantial investment in teacher training. Teachers must be equipped with strategies for integrating social-emotional learning, digital tools, and formative assessment into their daily practice—often within rigid curricular and institutional constraints.

Technology integration has been widely regarded as a facilitator of meta-subject competency development, particularly in terms of personalization and engagement. Platforms that enable interactive, student-centered learning—such as digital storytelling tools, coding apps, and virtual simulations—provide meaningful contexts for students to collaborate, problem-solve, and reflect. However, effective use of technology is contingent upon equitable access, digital literacy among educators, and the alignment of tech tools with pedagogical objectives. Without careful planning, technology risks becoming a distraction rather than a lever for deeper learning. Another central consideration involves the assessment of meta-subject competencies. Unlike traditional academic skills, which can be evaluated through standardized tests, meta-competencies are often latent, situational, and affective in nature. This presents a dilemma: how to assess competencies like creativity, collaboration, or ethical reasoning in a way that is both meaningful and developmentally appropriate. While portfolio-based assessment, peer feedback, and teacher observation offer promising alternatives, they also require time, training, and systemic support to implement effectively. Furthermore, cultural and contextual factors must be taken into account. The understanding and prioritization of meta-subject competencies vary significantly across educational systems. For example, in high-stakes exam-oriented contexts, teachers may experience pressure to “teach to the test,” leaving little room for interdisciplinary exploration or project-based learning. Conversely, in education systems with more flexible curricula—such as those in Finland or Canada—meta-competency development is more seamlessly integrated into daily instruction. This suggests that policy alignment and institutional autonomy are crucial in enabling meaningful pedagogical shifts.

Importantly, the early development of these competencies in primary school lays the groundwork for later success—not only academically, but socially and professionally. Skills such as empathy, resilience, and independent learning habits are not only transferable across subjects but also predictive of positive life outcomes. Longitudinal studies suggest that students who develop meta-subject competencies early are more likely to excel in secondary education and to adapt effectively to

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future learning environments, including higher education and the workforce. Despite these encouraging findings, there is no "one-size-fits-all" method for competency development. Effective practices must be responsive to the developmental needs of young learners, the sociocultural context of the school, and the capacities of teachers. Hybrid models that combine structured guidance with exploratory learning, individual tasks with group projects, and digital resources with real-world experiences appear to hold the most promise.

In conclusion, while the formation of modern meta-subject competencies in primary school represents an ambitious educational goal, it is both necessary and achievable. Success in this endeavor requires systemic commitment—through curriculum reform, teacher professional development, resource allocation, and assessment redesign. Only through such holistic efforts can we ensure that the youngest learners are equipped not just for academic success, but for meaningful participation in an uncertain and dynamic world.

Conclusion. The formation of meta-subject competencies in primary school is no longer an optional enrichment, but a necessity for preparing students to navigate a world marked by complexity, uncertainty, and rapid change. These competencies-encompassing critical thinking, creativity, collaboration, communication, and self-regulated learning-enable young learners to make meaningful connections across disciplines and apply their knowledge in diverse real-world contexts.

This study has demonstrated that fostering such competencies requires a shift from traditional, content-focused instruction toward more dynamic, learner-centered pedagogical models. Effective approaches include inquiry-based learning, project-based activities, socio-emotional learning integration, and thoughtful use of educational technologies. However, the success of these methods is contingent upon several factors, including well-prepared teachers, supportive curricular frameworks, flexible assessment strategies, and systemic institutional support. While challenges such as standardized testing pressures and unequal access to digital tools remain significant barriers, there is considerable evidence to support the value and feasibility of early competency development. Moving forward, education systems must adopt holistic, adaptable strategies that align curriculum, instruction, and assessment with the competencies necessary for students to become resilient, responsible, and innovative citizens of the 21st century.

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