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BEYOND LINGUISTIC COMPETENCE: SUBJECTIVITY, SCHOOL LIFE, AND TEACHER MEDIATION IN LATIN AMERICAN DIGITAL EDUCATION

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ABSTRACT

This manuscript develops an integrated policy framework for digital education in Latin America by placing two complementary 2025 studies into comparative dialogue: a large-scale Panamanian intervention using the DILE platform and a theoretical essay on anhedonia, digital exposure, and subjectivity in postmodern networked societies. The article argues that the most consequential limitation of current scholarship is its tendency to separate measurable educational performance from the subjective, relational, and institutional conditions under which digital learning occurs. Adopting a theoretical-propositional, comparative, and interpretive design, the study identifies five strategic research and policy gaps: the disconnection between learning gains and subjectivity, the lack of longitudinal and causal evidence, the underexamined role of generative artificial intelligence, the insufficient specification of teacher mediation, and territorial inequalities in digital implementation. Building on these findings, the manuscript proposes an Integral Pedagogical Ecology Model that organizes digital education around four interdependent dimensions: linguistic competence, subjectivity, school life, and digital pedagogical governance. The policy argument is that sustainable digital transformation cannot be evaluated only through access indicators or short-term achievement gains. It must also account for human development, school relationality, institutional mediation, and structural inequality. The article contributes to policy studies by offering a framework that links educational evaluation, critical pedagogy, and digital governance in a region where technological adoption often outpaces conceptual and institutional regulation.

KEYWORDS: Digital Education; Digital Literacy; Linguistic Competence; Subjectivity; School Life; Teacher Mediation; Policy Studies; Latin America.

1. INTRODUCTION

Digital transformation in education has become one of the most visible policy agendas of the last decade, yet its analytical treatment remains fragmented. International organizations and national systems increasingly frame digital education in terms of skills, assessment, employability, and ecosystem readiness, often emphasizing digital literacy, ICT competence, and the capacity of education systems to respond to technological change (ACARA, 2024; Bashir & Miyamoto, 2020; OECD, 2023b; UNESCO, 2023). In Latin America and the Caribbean, these debates are further shaped by structural inequality, weak connectivity, uneven institutional capacity, and the persistence of learning gaps that long predate the expansion of educational technologies (ECLAC, 2016, 2024a; ECLAC/OEI, 2020; Sunkel et al., 2014; Trucco et al., 2022). The result is a policy landscape in which digital education is frequently promoted as a lever for transformation while the conditions for meaningful, equitable, and human-centered implementation remain under-theorized.

At the same time, the concept of digital competence has evolved far beyond basic operational skills. Research has progressively shifted from narrow understandings of technological use to broader formulations that include information processing, communication, safety, problem solving, critical judgment, and context-sensitive participation (Aesaert et al., 2014; Bawden, 2008; Calvani et al., 2010; Fraillon et al., 2020; Law et al., 2018; Redecker, 2017). More recent frameworks also stress that digital literacy must be understood in relation to children's rights, well-being, online risks and opportunities, and the tangible outcomes that digital skills make possible in everyday life (Livingstone, 2016; Livingstone et al., 2015; Nascimbeni & Vosloo, 2019; Van Deursen et al., 2014). These developments are especially relevant for policy studies because they suggest that digital education cannot be reduced to infrastructure provision or performance metrics alone. Instead, it must be conceptualized as a governance problem involving capability formation, pedagogical mediation, and social protection.

Despite this conceptual expansion, many educational studies still privilege short-term cognitive outcomes over the broader subjective and relational consequences of digital schooling. This is particularly visible in the growing literature on platform-based interventions and digital assessment, where gains in reading, literacy, or ICT performance are frequently documented without parallel analysis of attention, agency, school climate, or the quality of mediated interaction (Fraillon & Rozman, 2024; García-Valcárcel et al., 2021; Jeon et al., 2023; MINEDU, 2023; Porat et al., 2018). In contrast, critical scholarship on networked life, online risks, and the social worlds of young people has shown that digital participation also reshapes identity, belonging, exposure, and inequality in ways that matter profoundly for educational policy (Boyd, 2014; ITU, 2021; Pavez, 2014; Šmahel et al., 2023; Trucco & Palma, 2020). The coexistence of these two traditions, one metric-driven and one critical-relational, has produced a significant explanatory gap.

This manuscript addresses that gap through a comparative reading of two complementary 2025 publications. The first is an empirical study on the DILE platform implemented in Panama, which reports significant gains in reading comprehension under real school conditions and highlights the importance of dosage, participation, and teacher mediation. The second is a theoretical essay on anhedonia and digital postmodernity, which argues that screen-mediated environments alter subjectivity, listening, social relations, and educational experience, a dynamic intensified by the emergence of generative AI. Considered together, these studies make visible a core problem for policy studies: how can digital education be evaluated if cognitive effectiveness and human formation are examined through separate analytical lenses?

The argument advanced here is that policy-oriented digital education research in Latin America needs an integrated framework capable of analyzing learning outcomes, subjectivity, school life, and governance simultaneously. This need has become more urgent with the rapid diffusion of generative AI in educational settings, which reconfigures not only how students access information, but also how they write, deliberate, interact, and attribute authorship (ECLAC, 2024a; Molina et al., 2024; OECD, 2023b). Accordingly, the article develops a theoretical-propositional model intended for Q1-level policy studies scholarship. Its contribution lies in connecting empirical educational evaluation with critical and institutional analysis to inform future research, system design, and public policy in Latin America.

2. METHOD

This manuscript adopts a theoretical-propositional approach designed to generate an integrated framework for research and policy on

digital education in Latin America. Rather than testing a new intervention, the study conducts a structured comparative interpretation of two complementary publications in order to identify the explanatory limits of current scholarship and formulate a broader analytical model. The methodological design is therefore interpretive, comparative, and policy-facing. Its purpose is not merely to summarize previous work, but to place heterogeneous forms of evidence into dialogue so that their convergences, tensions, and omissions can produce a more robust agenda for future inquiry.

The analytical corpus consists of two 2025 studies selected according to criteria of substantive relevance, methodological complementarity, regional specificity, and policy significance. The first is an empirical study of a large-scale Panamanian intervention using the DILE platform, involving 6,264 students across 40 schools with a quasi-experimental pretest-posttest design (Montoliu et al., 2025). The second is a theoretical essay on anhedonia, digital exposure, and transformations of subjectivity in postmodern networked environments, with particular attention to ChatGPT-mediated interactions (Esbri Montoliu & Mansilla Sepulveda, 2025). The logic of this dual selection is complementarity: the first provides evidence on cognitive and linguistic outcomes under real implementation conditions, while the second supplies a critical lens on subjective, relational, and ethical dimensions that outcome-centered studies often leave unexamined.

The analysis followed a three-stage interpretive strategy. First, object comparison was conducted to identify the research purposes, central constructs, and operative categories in each study. In the DILE article, the analysis focused on reading comprehension, platform usage, participation, and teacher mediation. In the anhedonia essay, the main constructs were subjectivity, listening, relational deterioration, exposure, and the educational effects of digital culture. Second, evidence and variable mapping were carried out to classify what each study measured, described, or assumed. Variables were organized into four domains: cognitive-linguistic, subjective-affective, relational-social, and institutional-pedagogical governance. Third, a gap and synthesis analysis contrasted observed versus unobserved variables in order to identify strategic voids for research and policy, particularly concerning generative AI, long-term reading development, teacher mediation as a humanizing factor, and territorial inequality.

To strengthen theoretical grounding and policy relevance, the comparative reading was extended through a supporting bibliography supplied for the project. These sources were not treated as part of the primary corpus but as contextual literature that situates the argument within broader debates on digital literacy, educational assessment, mediation, youth online experience, and development policy (ACARA, 2023, 2024; ECLAC, 2024a, 2024b; European Commission, 2020, 2022; Fraillon et al., 2020; ISTE, 2024; OECD, 2023a, 2023b; UNESCO, 2023). Their function was to expand conceptual anchoring and increase the manuscript's relevance for policy studies, not to alter the primary comparative design.

The analytical procedure was iterative rather than linear. Each text was first read independently to preserve its own conceptual architecture and argumentative logic. Key constructs, assumptions, findings, and recommendations were extracted. A second round of analysis then mapped points of convergence, such as the importance of mediation and digital exposure, and points of divergence, such as the contrast between measurable cognitive outcomes and unmeasured subjective transformation. In the final stage, these tensions were synthesized into the Integral Pedagogical Ecology Model, which links linguistic competence, subjectivity, school life, and digital pedagogical governance as inseparable dimensions of digital education.

Within this design, the researcher acts as both interpreter and theorist. The task is interpretive because it requires close comparative reading of heterogeneous scholarship without flattening epistemic differences. It is theoretical because the study moves from commentary to model construction. It is also explicitly policy-oriented because the objective is to produce a framework that can guide research design, educational decision making, and system governance in contexts marked by inequality, technological acceleration, and institutional asymmetry.

3. THEORETICAL FRAMEWORK

The theoretical foundation of this manuscript rests on the premise that digital education must be understood as a multidimensional policy field rather than as a narrow instructional technique. Digital literacy research has consistently shown that competence involves much more than technical manipulation of devices. It includes information access, evaluation, communication, critical interpretation, and the ability to translate digital skills into meaningful social outcomes

(Bawden, 2008; Hargittai & Micheli, 2019; Porat et al., 2018; Reichert et al., 2023; Spisak, 2022). Large comparative frameworks such as ICILS, DigCompEdu, and the UNESCO reference models have reinforced this broader understanding by framing digital competence as a layered construct tied to learning, participation, problem solving, and responsible citizenship (Fraillon & Rozman, 2024; Fraillon et al., 2020; Law et al., 2018; Redecker, 2017).

However, policy studies also require attention to the institutional and social environments in which such competencies are cultivated. From this perspective, digital education must be linked to governance, equity, and the organization of educational ecosystems. International policy documents increasingly speak of digital ecosystems, readiness, resilience, and transformation, recognizing that the educational value of technology depends on infrastructure, curriculum, teacher capacity, safety, and coherent system design (European Commission, 2020; ISTE, 2024; KERIS, 2022; OECD, 2023b). In Latin America, this ecosystemic view intersects with longstanding development traps and inequality structures that limit both access and the conversion of access into meaningful educational outcomes (ECLAC, 2016, 2024a, 2024b; Huepe et al., 2023; Katz et al., 2023). Consequently, digital transformation cannot be judged only by adoption rates. It must be assessed in terms of whether systems create equitable and pedagogically coherent conditions for learning.

A second strand of the framework concerns children's and adolescents' online lives. Research on networked youth has shown that the digital sphere is simultaneously a space of learning, opportunity, risk, participation, surveillance, and social comparison (Boyd, 2014; Livingstone, 2016; Livingstone et al., 2015; Pavez, 2014; Trucco & Palma, 2020). These studies are crucial because they remind policymakers that educational digitalization cannot be detached from broader patterns of exposure, protection, and rights. Digital schooling intersects with children's well-being, privacy, safety, and identity formation, especially in mobile-first contexts and in societies where family, school, and market logics are unevenly aligned (Clark et al., 2017; ITU, 2021; Nascimbeni & Vosloo, 2019).

A third theoretical component relates to inequality. The digital divide is no longer understood only as a gap in physical access, but as a layered set of disparities involving quality of use, skill acquisition, autonomy, and the capacity to convert digital engagement into learning or economic opportunity (Claro et al., 2011; Rohatgi et al., 2016; Van Deursen et al., 2014). Latin American scholarship has repeatedly shown that socioeconomic conditions, school resources, territorial location, and gender shape both the quantity and quality of digital participation (AGESIC et al., 2023; Gebhardt et al., 2019; Regueira & Alonso-Ferreiro, 2022; Sunkel et al., 2014; Trucco et al., 2022). This perspective is particularly important for policy studies because it shifts the focus from universal technological optimism to differentiated governance strategies.

Finally, the manuscript incorporates a critical pedagogical perspective on subjectivity and mediation. While digital competence frameworks clarify what students should know and be able to do, they often say less about what happens to educational experience when learning is increasingly organized through screens, platforms, and algorithmic interfaces. The theoretical essay included in the primary corpus foregrounds this issue by arguing that digital environments can fragment attention, alter listening, and transform school coexistence. This concern is heightened by the rise of generative AI, which has introduced synthetic interlocutors into the learning process and thereby complicated questions of authorship, judgment, dependency, and epistemic trust (ECLAC, 2024a; Molina et al., 2024; UNESCO, 2023). The present framework therefore treats teacher mediation not as a supplementary instructional variable, but as a central humanizing mechanism that shapes tempo, meaning, dialogue, and accountability within digital learning ecologies.

Table 1. Integral Pedagogical Ecology Model (IPEM): Core dimensions for digital education policy

Dimension	Analytical focus	Illustrative policy indicators
Linguistic competence	Reading comprehension, vocabulary, writing, oral production, transfer across tasks	Learning gains; depth of reading; writing quality; transfer beyond platform use
Subjectivity	Attention, agency, self-efficacy, meaning-making, affective disposition	Student voice; self-efficacy; reflective engagement; ethical use of AI
School life	Listening, participation, recognition, coexistence, relational climate	School climate measures; peer interaction quality; inclusion and digital safety
Digital pedagogical governance	Teacher mediation, curriculum alignment, infrastructure, rules, institutional support	Teacher training; mediation protocols; device/connectivity sufficiency; governance guidelines

4. COMPARATIVE SYNTHESIS OF THE PRIMARY CORPUS

The comparative analysis of the two core studies revealed a recurrent asymmetry in digital education research. The Panamanian DILE study provides robust evidence that structured digital intervention can improve reading comprehension and that the magnitude of these gains is associated with usage intensity, participation, and teacher support. Yet, because the design is oriented toward measurable performance, the learner appears mainly as a user whose progress is assessed through outcomes and interactions. The study offers strong policy value for implementation but limited conceptual insight into the student as a subject embedded in relational and symbolic life.

The theoretical essay on anhedonia provides that missing conceptual depth by focusing on what digital environments may do to attention, silence, listening, and social bonds. Its concern is not whether students obtain better short-term scores, but whether digitally mediated school life can weaken the reflective and relational conditions under which education acquires human significance. However, because this argument is not tested in concrete educational settings, it remains difficult to translate into operational policy criteria. From a policy studies standpoint, the two texts therefore illuminate opposite sides of the same problem: one is empirically strong but relationally thin; the other is conceptually rich but institutionally under-operationalized.

Read together, the studies point to five strategic gaps of high policy relevance. First, there is a lack of research capable of examining learning gains and subject formation simultaneously. Second, longitudinal and causal evidence remains limited, which weakens policy confidence in scaling digital interventions. Third, generative AI has entered educational practice faster than frameworks have adapted to evaluate its cognitive, ethical, and relational implications. Fourth, teacher mediation is recognized as important but insufficiently specified as a policy variable. Fifth, territorial inequality is often treated as an implementation obstacle rather than as a constitutive dimension of digital educational outcomes. These five gaps structure the policy discussion that follows.

5. DISCUSSION

The findings of this manuscript have three broad implications for policy studies. The first is conceptual. Digital education should be analyzed as a governance field in which competencies, institutional design, and human development are mutually constitutive. This view is consistent with current international policy thinking, which increasingly frames digital transformation as an ecosystem issue rather than a matter of isolated tools (European Commission, 2020; OECD, 2023b; UNESCO, 2023). Yet the present analysis extends that conversation by arguing that ecosystem approaches remain incomplete if they exclude subjectivity and school life. Systems may be technically functional and still pedagogically impoverished if they privilege automation, speed, or access while neglecting dialogue, reflection, and relational cohesion.

The second implication is methodological. Policy design requires stronger forms of evidence than those currently available in much of the regional literature. Assessment frameworks from Australia, ICILS, Korea, and other contexts show that digital literacy can be measured with increasing sophistication, including direct performance tasks and multidimensional constructs (ACARA, 2023, 2024; Aesaert et al., 2014; Fraillon & Rozman, 2024; Jeon et al., 2023; KERIS, 2022). However, educational policy in Latin America would benefit from designs that combine these measurement advances with indicators of self-efficacy, belonging, online risk, mediation quality, and territorial inequality. Otherwise, policymakers will continue to receive partial evidence that overstates efficiency while understating social cost and institutional fragility.

The third implication concerns generative AI. Current policy debates often oscillate between enthusiasm for innovation and concern about disruption, but both positions risk remaining superficial if they fail to locate AI within existing inequities and pedagogical routines. Recent reports suggest that AI may enhance personalization, productivity, and access to information, yet they also raise concerns about judgment, misinformation, disinformation, dependency, and the erosion of critical literacy (ECLAC, 2024a; European Commission, 2022; Molina et al., 2024). The policy issue is therefore not whether AI should enter education - it already has - but under what governance conditions it can support educational quality without weakening students' authorship, agency, or capacity for deep reading and deliberation.

This discussion also reinforces the importance of teacher mediation as a policy variable rather than a private classroom trait. The comparative corpus and the broader literature converge on the idea that

digital learning is not self-sustaining; it is shaped by feedback, scaffolding, curricular framing, and opportunities for guided interpretation (ISTE, 2024; OECD, 2023a; Redecker, 2017). From a policy perspective, this implies that teacher support, professional development, and mediation protocols should be considered core components of digital transformation budgets, not secondary add-ons. This point is especially important in low- and middle-income contexts, where interventions often fail not because devices are unavailable, but because pedagogical use remains under-supported (ILO, 2021; Misra, 2022).

Finally, the policy relevance of territorial inequality cannot be overstated. Latin American countries continue to face differentiated patterns of connectivity, school capacity, and digital participation that interact with gender, income, and geography (AGESIC et al., 2023; Aramburu et al., 2021; ECLAC, 2024c; Huepe, 2024; Katz et al., 2023). A policy studies approach must therefore move beyond generic calls for inclusion and instead ask which combinations of infrastructure, training, protection, and local governance enable digital education to produce both learning and well-being. This is the principal value of the Integral Pedagogical Ecology Model: it offers a way to connect educational effectiveness with the social and institutional conditions that make effective and humane digital education possible.

6. POLICY IMPLICATIONS

From a policy studies perspective, the first implication of the integrated analysis is the need to replace access-centered monitoring with multidimensional evaluation frameworks. Digital policy can no longer be judged only by connectivity rates, device distribution, or short-term achievement gains, because contemporary evidence shows that meaningful digital competence includes information processing, communication, critical judgment, and context-sensitive use of technology (ACARA, 2024; Aesaert et al., 2014; Fraillon & Rozman, 2024; Reichert et al., 2023). In practical terms, this means that ministries and school systems should evaluate not only whether students connect, but also whether digital interventions strengthen deep reading, guided participation, self-efficacy, and critical engagement with information in ways that support durable learning and school belonging (OECD, 2023b; UNESCO, 2023).

A second implication is that digital reform must be territorially differentiated rather than uniformly prescribed. Latin American digital ecosystems are shaped by unequal patterns of infrastructure, school capacity, household resources, gendered participation, and local governance; consequently, policies designed as if all schools faced the same implementation conditions risk reproducing or amplifying existing inequalities (AGESIC et al., 2023; ECLAC, 2016, 2024a, 2024c; Trucco & Palma, 2020). A policy-oriented approach therefore requires differentiated strategies that calibrate investment, support, and accountability according to connectivity conditions, institutional readiness, and the specific social vulnerabilities that structure students' opportunities to participate in digital learning (Katz et al., 2023; Trucco et al., 2022).

Third, teacher mediation must be treated as a core policy pillar rather than as an invisible classroom variable. The comparative corpus suggests that digital learning does not become educationally meaningful through exposure alone; its quality depends on feedback, scaffolding, curricular framing, and opportunities for guided interpretation. This is consistent with international frameworks that position educators as designers and mediators of digital learning environments rather than mere users of tools (ISTE, 2024; Redecker, 2017). For policy design, the implication is clear: professional development, pedagogical accompaniment, and mediation protocols should be funded as structural components of digital transformation, especially in systems where technological investment has advanced more quickly than teachers' supported capacity to translate digital resources into reflective learning (Montoliu et al., 2025; OECD, 2023b).

fourth implication concerns the governance of generative artificial intelligence in schools. The rapid expansion of systems such as ChatGPT has shifted the policy debate from digital access to algorithmically mediated authorship, judgment, and epistemic trust. Recent international analyses converge on the idea that AI may improve personalization, productivity, and access to information, but they also warn that these benefits can coexist with misinformation, dependency, superficial processing, and weakened critical literacy if governance mechanisms are weak (ECLAC, 2024a; European Commission, 2022; Molina et al., 2024; OECD, 2023b). Accordingly, school policy should establish explicit protocols for transparency, authorship, verification, and critical AI literacy so that students learn not only to use AI tools, but to interrogate their outputs, limits, and implications for educational agency (UNESCO, 2023).

Finally, digital education policy should be embedded within broader agendas of child protection, social inclusion, and rights-based governance. Research on children's online experience has shown that opportunities and risks are deeply intertwined, and that educational modernization without safeguards may intensify exclusion, exposure, or vulnerability rather than reduce them (ITU, 2021; Livingstone, 2016; Livingstone et al., 2015; Pavez, 2014). For that reason, policy frameworks for digital education should integrate well-being, participation, protection, and equity as constitutive principles of reform rather than as external correctives. This broader framing is especially important in Latin America, where digital schooling operates within unequal social structures and where the legitimacy of innovation depends on its capacity to expand both learning and human development in ethically sustainable ways (ECLAC/OEI, 2020; UNESCO, 2023).

7. CONCLUSIONS

This manuscript has argued that the key limitation of current digital education scholarship in Latin America is its tendency to separate measurable performance from subjectivity, school life, and governance. By comparing a large-scale Panamanian intervention study with a critical theoretical essay on digital anhedonia, the analysis has shown that both empirical efficacy and human formation must be considered together if policy is to be both effective and legitimate. The resulting Integral Pedagogical Ecology Model offers a framework for organizing that integration.

For policy studies, the contribution is twofold. Analytically, the manuscript proposes a way to connect digital literacy, educational evaluation, relational life, and institutional design within a single interpretive frame. Practically, it suggests that digital transformation should be judged not only by whether students connect, click, or score higher, but by whether systems cultivate reflective, relational, and ethically grounded learning under conditions of equity. In a region where technological adoption often advances faster than pedagogical or regulatory coherence, such an integrated approach is no longer optional; it is a policy necessity.

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