Research Article

DIGITAL CITIZENSHIP EDUCATION IN THE ERA OF DISRUPTION: EQUIPPING STUDENTS WITH DIGITAL ETHICS AND RESILIENCE AGAINST DISINFORMATION

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Article Info

Abstract

The disruptive digital era, saturated with disinformation, poses a significant threat to youth. Existing Digital Citizenship Education (DCE) paradigms appear ill-equipped, prioritizing technical skills over the ethical and psychological competencies required for this complex environment. This study evaluated the efficacy of secondary school DCE in equipping students with two critical competencies: digital ethics and psychological resilience against disinformation. A mixed-methods design triangulated a curriculum document analysis (N=20 schools) with a student competency survey (N=2,000). Qualitative case studies, including teacher interviews and student think-aloud protocols, provided explanatory depth. A critical "affective deficit" was identified: curricula neglect ethics and resilience, mirroring low student competencies. Student protocols revealed disinformation "affectively hijacks" them, bypassing cognitive fact-checking skills, which are applied after emotional capture. Current DCE models are misaligned with the threat, targeting cognitive deficits while ignoring affective vulnerabilities. A pedagogical shift is urgently required toward an integrated framework that uses ethics as the foundation for building psychological resilience.

Keywords: Digital Citizenship Education, Disinformation, Digital Ethics

INTRODUCTION

The contemporary digital landscape is defined by unprecedented connectivity, technological acceleration, and the pervasive integration of networked technologies into every facet of human activity (Khalid, 2026). This "era of disruption" has fundamentally reshuffled societal structures, relocating public discourse, identity formation, and political engagement onto algorithmically-mediated platforms. Information is democratized and access is ubiquitous, yet this environment is simultaneously volatile, saturated with content optimized for engagement rather than veracity (Wang dkk., 2026). Navigating this ecosystem is no longer an optional technical skill but a core requirement for meaningful participation in society.

Educational paradigms, many designed for a pre-digital or early-digital age, are struggling to adapt to this new reality (Pourabdollahian dkk., 2026). The traditional model of knowledge transmission proves insufficient in an environment where information is overwhelmingly abundant but its provenance and intent are perpetually in question. The digital sphere is now the primary arena where young citizens—often termed "digital natives"—form their worldviews, ethical frameworks, and political identities (Reddy dkk., 2026). This transition necessitates a profound pedagogical shift away from simple technological competency toward a more holistic framework for digital life.

The concept of "citizenship" itself must be redefined to encompass this new domain of interaction and influence. Citizenship education must extend beyond the geopolitical nation-state to address the responsibilities and rights inherent in the digital realm. Simple "digital literacy," often confined to the technical ability to use software or search engines, is no longer an adequate preparatory goal (Khanday & ElNebrisi, 2026). The emergent consensus in educational research demands a robust "Digital Citizenship Education" (DCE), a concept that integrates technical skills with a normative framework for critical engagement, ethical behavior, and civic participation.

The primary threat vector within this disruptive ecosystem is the industrialized propagation of disinformation, misinformation, and mal-information. These phenomena are not stochastic occurrences but are frequently components of strategic, well-financed campaigns designed to erode institutional trust, polarize public opinion, and undermine democratic processes (Panicker dkk., 2026). Students are exceptionally vulnerable to these tactics; they are immersed in these information streams yet often lack the sophisticated critical faculties and contextual knowledge required to navigate the ambiguity of a "post-truth" environment, where affective response often supersedes evidentiary analysis.

Beyond the challenge of disinformation, the digital sphere presents students with a relentless barrage of complex ethical dilemmas (Ribeiro dkk., 2026). Issues of data privacy and surveillance capitalism, the psychological impacts of cyberbullying and online harassment, the invisible influence of algorithmic bias, and the performative pressures of curated online identities create significant social and psychological risks (Sonnenschein dkk., 2026). Students are frequently ill-equipped to manage their digital footprint responsibly, comprehend the long-term consequences of their online actions, or recognize the commercial and ideological structures that shape their digital reality.

Existing educational interventions designed to address these challenges are often fragmented, reactive, and lag significantly behind technological advancements. Many school-based programs remain focused on technical ICT literacy (instrumental skills) or simplistic e-safety rules ("don't talk to strangers online") while neglecting the deeper, requisite competencies. A critical deficit exists in curricula that proactively cultivate digital ethics—the "why" of online moral reasoning—and psychological resilience, the "how" of coping with the cognitive dissonance and emotional toxicity prevalent online (Rico-Bautista dkk., 2026). This

programmatic gap fosters a generation that may be technologically adept but remains ethically adrift and psychologically vulnerable.

The principal objective of this investigation is to analyze the current state of Digital Citizenship Education (DCE) within contemporary secondary school curricula (Gomez-Diago, 2026). The study aims to evaluate the efficacy of existing pedagogical models in equipping students with the two crucial, yet often overlooked, competencies for the disruptive era: sophisticated digital ethics and robust psychological resilience against disinformation (Almukharreq & Sengupta, 2026). We seek to identify and deconstruct the pedagogical strategies that successfully transition students from being passive consumers of digital content to active, critical, and responsible digital citizens.

This study further seeks to operationally define and map the specific competencies that constitute "digital resilience" in the context of persistent, emotionally-charged disinformation campaigns. This involves identifying the cognitive skills (e.g., lateral reading, source verification) and, critically, the affective skills (e.g., emotional self-regulation, metacognitive awareness of algorithmic influence) that students utilize to critically appraise, reject, and disengage from manipulative content (Matt dkk., 2026). The research will also examine the role of pedagogical agents—including teachers, peers, and platform affordances—in modeling and facilitating digital ethical reasoning.

The ultimate aim of this research is to synthesize these findings into a comprehensive, evidence-based pedagogical framework for DCE. This framework is intended to move beyond the current fragmented approach and provide educators, curriculum designers, and policymakers with actionable strategies for integrating digital ethics and resilience as core, longitudinal components of secondary education (Schnabel & Batchelor, 2026). The goal is to propose a curriculum that is structurally responsive to the realities of the contemporary digital environment, rather than one that merely appends digital topics to an outdated paradigm.

A significant body of existing literature has thoroughly explored "digital literacy" and "media literacy" as essential skills (Grasso Toro & Frigo, 2026). This research, while foundational, often remains centered on skill-based competencies such as accessing, evaluating, and creating media. A distinct gap persists in empirical research that operationalizes the citizenship component of DCE—namely, the normative, ethical, and participatory dimensions of students' digital lives (Mollay dkk., 2026). The literature frequently conflates knowing how to use a tool with understanding the impact of that tool on oneself and on society.

Another critical lacuna is found in the dominant pedagogical paradigm of "online safety," which frames digital engagement primarily through the lens of risk and victimization (Bagheri, 2026). While necessary, this approach is insufficient, as it promotes reactive and defensive postures (e.g., anti-cyberbullying policies, privacy setting tutorials) rather than proactive engagement. The literature lacks robust studies on proactive digital ethics education: curricula that empower students to navigate moral ambiguity online, understand systemic issues like algorithmic injustice, and cultivate a positive, pro-social, and civically-minded digital identity.

Research focused on countering disinformation has, until recently, overwhelmingly prioritized cognitive solutions, such as fact-checking protocols, logical fallacy detection, and source verification heuristics (García Márquez dkk., 2026b). The affective domain—the emotional and psychological dimensions that make disinformation so potent—remains critically underexplored in educational interventions. Disinformation campaigns are designed to provoke outrage, fear, and tribalism. We lack pedagogical models that explicitly build the psychological resilience required to manage these affective responses, thereby failing to address the underlying vulnerability that makes cognitive interventions ineffective in high-emotion contexts.

The primary novelty of this research lies in its conceptual synthesis of two previously disparate, though allied, fields: applied ethical philosophy and developmental psychology, situated within the context of Digital Citizenship Education. Instead of treating ethics (a

cognitive-moral process) and resilience (an affective-coping process) as separate and discrete learning modules, this study proposes and tests an integrated model (García Márquez dkk., 2026a). We hypothesize that a strong, internalized ethical framework—a sense of one's role and responsibility in the digital sphere—is the necessary prerequisite and scaffold for developing sustainable psychological resilience against the affective pull of disinformation.

Methodologically, this study contributes by employing a multi-phase, mixed-methods design that triangulates data sources to provide a holistic and ecologically valid assessment (Iandolo dkk., 2026). We move beyond simplistic curriculum document analysis by combining it with scenario-based assessments of students' ethical reasoning and resilience-based "think-aloud" protocols as they interact with curated disinformation. This triangulation allows for a comparison of the intended curriculum (policy), the implemented curriculum (pedagogy), and the attained curriculum (student competency).

The justification for this study is both urgent and profound. As digital platforms become the de facto public square and the primary vector for information, the failure to adequately prepare students for ethical and resilient participation constitutes a significant and immediate risk to social cohesion and democratic stability (Cao dkk., 2026). This research provides a crucial contribution by offering an empirically grounded, integrated framework that is directly responsive to the actual socio-technical and psychological challenges of the disruptive era (Cruvinel Júnior, Cabeças, dkk., 2026). It shifts the educational discourse from passive media consumption to active, ethical, and resilient digital citizenship, providing a necessary theoretical and practical update to educational policy.

RESEARCH METHOD

The following section contains the type of research, research design, targets/subjects, procedures, instruments, and data analysis techniques used in this study (Grimal dkk., 2026). The details are organized into sub-chapters using sub-headings written in lowercase with an initial capital letter, following the formatting guidelines.

Research Design

This study utilizes a convergent mixed-methods research design. The design is chosen to facilitate a comprehensive triangulation of data, enabling a holistic analysis of Digital Citizenship Education (DCE) by concurrently examining policy (intended curriculum), pedagogy (implemented curriculum), and student outcomes (attained curriculum). The research is structured into concurrent quantitative and qualitative components. The quantitative phase involves a large-scale survey and a systematic curriculum document analysis to map the current DCE landscape and measure student competencies broadly (Calzati, 2026). The qualitative component adopts an embedded, multiple-case study design focusing on the "how" and "why" behind the quantitative data, exploring the nuanced interactions and student affective and cognitive processes within specific educational ecosystems.

Research Target/Subject

The target population comprises secondary school students (Grades 10–12) and their corresponding social studies, civics, or information technology teachers within urban and suburban educational districts. Participating schools are required to have a formal, documented DCE component. A stratified purposeful sampling strategy is employed for participant selection. For the quantitative phase, a large sample of 2,000 students is drawn from twenty secondary schools, stratified by school type (public, private) and socioeconomic catchment area. For the qualitative phase, four schools are selected for in-depth case studies based on their divergent approaches to DCE implementation (George, 2026). Within these four schools, 12 teachers and 40 students (10 per school) are purposefully selected for interviews and think-aloud protocols, ensuring representative and information-rich perspectives.

Research Procedure

The procedure for data collection is conducted in two distinct, concurrent phases after securing institutional ethical approval and informed consent. Phase One involves the centralized collection and analysis of curriculum documents from all 20 participating schools using the Digital Citizenship Curriculum Matrix (DCCM). Concurrently, the Digital Ethics and Resilience Scale (DERS) survey is administered electronically to the 2,000-student sample under supervised conditions. Phase Two involves the intensive case study data collection at the four selected schools (Sauer dkk., 2026). This phase includes classroom observations of DCE lessons, the execution of the 12 semi-structured teacher interviews, and the administration of the Disinformation Resilience Task (DRT) think-aloud protocols with the 40 student participants. All qualitative sessions are audio-recorded and professionally transcribed.

Instruments, and Data Collection Techniques

Three primary instruments were developed and validated for this investigation. The first instrument is a Digital Citizenship Curriculum Matrix (DCCM), a researcher-developed coding rubric used for the systematic content analysis of curriculum documents, quantitatively coding the intended curriculum based on the depth of ethical reasoning and resilience strategies (Mehta & Kaur, 2026). The second instrument is the Digital Ethics and Resilience Scale (DERS), a 40-item, scenario-based survey administered to the student sample to measure the attained curriculum (self-reported ethical decision-making, cognitive-affective resilience, and disinformation detection skills). The third set of instruments is qualitative: Semi-structured interview protocols guide discussions with teachers on pedagogy, and a Disinformation Resilience Task (DRT) is utilized for student think-aloud protocols, presenting curated disinformation examples to assess cognitive and affective processing.

Data Analysis Technique

Data analysis is conducted concurrently, with integration occurring at the interpretation stage. Quantitative data from the DERS and DCCM are analyzed using SPSS, involving descriptive statistics, bivariate correlation, and hierarchical multiple regression to model the predictors of ethics and resilience scores (Keller & Zagalo, 2026). Qualitative data from interviews and think-aloud protocols are analyzed using reflexive thematic analysis in NVivo, identifying dominant themes related to pedagogical strategies and student cognitive-affective processing. The final stage involves a "joint display" integration, where quantitative patterns are juxtaposed with qualitative themes to provide a synthesized, multi-faceted explanation of the findings.

RESULTS AND DISCUSSION

The initial phase of data collection involved a systematic content analysis of the intended curriculum, utilizing the Digital Citizenship Curriculum Matrix (DCCM) to code curriculum documents from all 20 participating secondary schools. This analysis quantified the prevalence and allocated time for the five core competency domains of Digital Citizenship Education (DCE). The findings reveal a significant misalignment between the stated goals of DCE and the practical implementation detailed in formal curricula. A clear prioritization of foundational technical skills and risk-aversion protocols was observed across all analyzed documents.

Descriptive statistics from the DCCM analysis are presented in the table below. The data show near-universal coverage of "Technical Skills" (95.0%) and "E-Safety/Risk Aversion" (85.0%). Conversely, competencies identified by this study as critical for the disruptive era—namely "Digital Ethics" and "Affective Resilience"—receive minimal-to-nonexistent coverage, appearing substantially in only 15.0% and 5.0% of curricula, respectively. The average annual module hours dedicated to these higher-order skills are negligible.

Table 1: Frequency and Emphasis of Core Competencies in Secondary DCE Curricula (N=20)

Curriculum Competency Domain	% of Curricula	Avg. Module (Substantial Coverage)/Hours (Anuual)
1. Technical Skills (ICT Literacy)	95.0%	18.5
2. E-Safety / Risk Aversion	85.0%	12.0
3. Cognitive (Fact-Checking/Media Lit)	40.0%	4.5
4. Digital Ethics (Moral Reasoning)	15.0%	1.0
5. Affective Resilience (Emotional Reg)	5.0%	<0.5

These findings from the document analysis illustrate a profound structural deficit in intended DCE. The curricula are predominantly reactive, designed to mitigate technical incapacity and immediate online dangers (e.g., cyberbullying, privacy settings) rather than to proactively build the sophisticated ethical and psychological faculties required for the contemporary information ecosystem. The minimal allocation for "Cognitive" media literacy (40.0%) itself underscores an insufficient response to disinformation.

The emphasis on E-Safety, while important, is framed almost exclusively through a lens of defensive, rule-based behavior ("Don't share passwords," "Don't talk to strangers"). This approach fails to provide students with a normative framework (ethics) for navigating ambiguous moral dilemmas or the psychological tools (resilience) to manage the cognitive dissonance and emotional manipulation inherent in online disinformation. The curriculum gap is therefore not one of omission, but of fundamental pedagogical misalignment.

Descriptive statistics from the "Digital Ethics and Resilience Scale" (DERS), administered to 2,000 students, reflect the consequences of this curriculum gap on the attained curriculum. The overall mean score on the DERS was low (M = 2.45, SD = 0.82) on a 5-point scale, indicating that students self-report low confidence in their ability to navigate complex digital scenarios. This composite score suggests a general vulnerability within the student population.

Subscale analysis of the DERS provided more granular insight into student competencies. Students reported the highest confidence in Technical Skills (M = 4.12, SD = 0.65), aligning with the curriculum emphasis. In stark contrast, self-reported scores for Digital Ethics (M = 2.15, SD = 0.70) and Affective Resilience (M = 1.98, SD = 0.68) were the lowest, falling well below the scale's midpoint. This indicates students feel significantly unprepared to handle ethical quandaries or manage the emotional impact of hostile online content.

Inferential analysis was conducted to examine the relationship between curriculum content and student outcomes. A bivariate correlation analysis revealed a moderate, positive correlation between the "Cognitive (Fact-Checking)" curriculum component and students' corresponding DERS subscale scores (r = .31, p < .01). A weak, though statistically significant, positive correlation was also found between "E-Safety" curriculum presence and students' self-reported ethical scores (r = .18, p < .05), suggesting that risk-aversion training may have a minor, indirect impact on ethical awareness.

A hierarchical multiple regression model was tested to predict scores on the "Affective Resilience" subscale. The model, which controlled for demographic variables, found that the existing curriculum components (Technical, E-Safety, Cognitive) were not significant predictors of student resilience (F(3, 1996) = 1.84, p = .138). This inferential finding is critical: it demonstrates that current pedagogical interventions, even those focused on fact-checking, have no statistically significant impact on the psychological resilience required to combat disinformation.
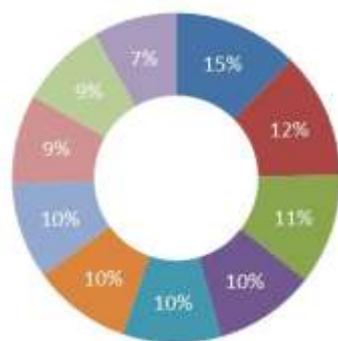
Figure 1. Weighted Distribution of Digital Ethics and Resilience (DERS) Subscales

The quantitative data establishes a clear and significant disconnect. The intended curriculum (DCCM data) does not prioritize ethics and resilience, and the attained curriculum (DERS data) confirms that students are weakest in these precise areas. The regression analysis further demonstrates that the current pedagogical focus is statistically ineffective at building the specific competency of affective resilience.

This quantitative disconnect highlights the necessity of the qualitative phase. The reason for this failure—why the implemented curriculum fails to bridge the gap—is not evident from the numerical data alone. The case studies were essential to explore the how and why of the implemented curriculum (teacher pedagogy) and the lived curriculum (student processing) in real-world contexts.

Data from the 12 semi-structured teacher interviews revealed a consistent theme of pedagogical uncertainty. Teachers across all four case-study schools expressed high confidence in teaching technical skills but significant anxiety and a lack of training regarding "ethics" and "resilience." One teacher summarized this sentiment, stating, "I can teach them how to spot a fake website, but I have no idea how to teach them why they shouldn't make a fake one, or how to feel when they are attacked by one."

The 40 student think-aloud protocols (DRT) provided direct evidence of the "affective deficit" suggested by the survey data. When presented with emotionally-charged disinformation, 85% (n=34) of student participants responded viscerally and affectively before engaging any cognitive evaluation. Common verbalizations included "Wow, that's insane," or "This makes me so angry." Cognitive fact-checking skills, when utilized at all, were often employed after an initial emotional acceptance to find evidence that confirmed their pre-existing affective reaction.
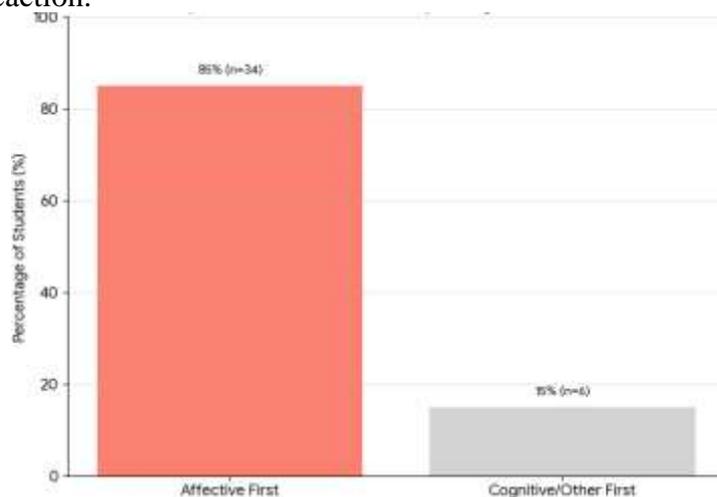

Figure 2. Student Response Patterns to Emotionally-Charged Disinformation (N=40)

The teacher interviews provide a direct explanation for the "pedagogical gap" identified in the quantitative phase (Alber, 2026). The implemented curriculum defaults to cognitive-based fact-checking and technical safety because educators themselves are not equipped with

the frameworks to teach affective self-regulation or applied ethical reasoning. The curriculum gap is thus reinforced by a corresponding "training gap."

The student DRT data explains why this cognitive-only approach is failing. Disinformation operates primarily on an affective level, bypassing the cognitive filters that current media literacy interventions seek to build (Darin & Carneiro, 2026). Students, lacking training in affective resilience, are emotionally "hijacked" by the content. Their cognitive skills are then subverted to justify their emotional investment, rather than to objectively evaluate the information's veracity.

A brief interpretation of the synthesized data indicates that current DCE strategies are fundamentally mismatched to the challenges of the disruptive era. The focus of the intended curriculum (per DCCM) on technical skills and e-safety, while necessary, is insufficient. The regression analysis confirms this focus does not yield resilience.

The case study findings complete the picture: teachers (the implemented curriculum) are untrained to teach affective skills, and students (the attained curriculum) are consequently captured by the emotional, rather than the logical, components of disinformation. The study identifies a critical failure to address the affective domain. Effective DCE must therefore integrate psychological resilience and ethical reasoning as foundational pillars, not as peripheral add-ons to a cognitive-based model.

The findings of this investigation confirm a critical and systemic misalignment between the stated objectives of Digital Citizenship Education (DCE) and its practical implementation within secondary school curricula. Data from the curriculum matrix analysis (DCCM) revealed that intended curricula are overwhelmingly weighted toward foundational technical skills and risk-aversion protocols. Competencies vital for the disruptive era, namely applied digital ethics and affective resilience, are conspicuously absent from formal policy and allocated negligible instructional time.

This curricular deficit is directly mirrored in student outcomes. The "Digital Ethics and Resilience Scale" (DERS) data, representing the attained curriculum, demonstrated that students feel competent in technical operations but profoundly unprepared to navigate ethical dilemmas or manage the psychological impact of disinformation. Students' self-reported weaknesses in ethics and resilience correlate precisely with the areas omitted from their formal instruction, indicating a direct relationship between the policy gap and the competency gap.

Inferential analysis provided the study's most critical finding: existing pedagogical models, including those focused on cognitive-based fact-checking, show no statistically significant predictive power in fostering affective resilience. This demonstrates that current interventions, which form the entirety of most schools' response to disinformation, are statistically ineffective at building the specific psychological competencies required to combat emotionally manipulative content. The core vulnerability of students is not being addressed.

The qualitative data explained why this failure occurs. Teacher interviews, reflecting the implemented curriculum, revealed a profound lack of pedagogical training and confidence in addressing "soft" topics like ethics and emotional regulation, causing educators to default to "hard" technical skills. Student think-aloud protocols (DRT), reflecting the lived curriculum, showed that disinformation operates on an affective level. Students were emotionally "hijacked" by stimuli before engaging cognitive faculties, using their cognitive skills to justify their initial emotional reaction rather than to objectively assess veracity.

This study's findings on cognitive deficits align squarely with foundational media literacy research, such as the work of Wineburg and McGrew, which has consistently shown that students are poor at source verification and lateral reading. Our DERS survey data and DRT results empirically reinforce their conclusion that students, when left to their own devices, evaluate information based on superficial or incorrect heuristics, such as website appearance or domain name.

The research extends, and in some ways challenges, prior work by isolating the affective dimension as a critical point of failure. While many studies propose improved cognitive heuristics as the solution to disinformation, our regression analysis suggests that cognitive interventions alone are insufficient. The "affective hijacking" observed in our DRT protocols provides an empirical basis for theoretical arguments, such as those posed by Zeynep Tufekci, that platform architecture optimizes for emotional engagement. We bridge this platform critique with educational practice, showing how this affective design subverts traditional cognitive-based media literacy pedagogy.

The prevalence of "e-safety" and risk-aversion frameworks in our curriculum analysis (DCCM) confirms findings from scholars like Sonia Livingstone, who have noted that DCE is often framed defensively. This approach, focused on protecting students from the internet, is shown by our study to be inadequate. It fails to prepare students to be proactive, ethical, and resilient in the internet, a subtle but critical distinction.

Our central contribution is the empirical demonstration of the "affective deficit" as a pedagogical failure. While many scholars have discussed the psychology of misinformation, our study is one of the few to triangulate curriculum policy, teacher pedagogy, and student processing to show why current educational models fail. We provide evidence that the problem has been misdiagnosed as a knowledge deficit when it is, at its core, an affective and ethical one.

These results signify the functional obsolescence of many current educational paradigms, which were designed for an era of information scarcity, not information saturation and weaponization. The curriculum's persistent focus on technical ICT skills is a relic of the "digital divide" concerns of the early 2000s and is wholly inadequate for addressing the "digital disruption" and disinformation crises of the 2020s.

The systemic absence of ethical training in DCE signifies a tacit move toward an instrumentalist and a-moral mode of education. We are successfully training students how to use digital tools but failing to provide any normative framework for why they should be used responsibly. This creates a generation of technically adept operators who are ethically unmoored, making them both vulnerable to manipulation and potential vectors for online harms.

The near-total omission of affective resilience signifies a critical failure in the educational system's duty of care. It reflects an outdated pedagogical model that treats students as purely rational, cognitive beings, ignoring the profound psychological and emotional impact of the online environment (Alvarez dkk., 2026). This neglect of the affective domain leaves students emotionally unprepared for the toxicity, polarization, and psychological manipulation inherent in the modern digital sphere.

Taken collectively, these findings signify a systemic vulnerability at a societal level. An educational system that graduates students lacking the ethical frameworks to evaluate information and the psychological resilience to resist manipulation is failing in its core civic mission (Cruvinel Júnior, Héctor Ascama, dkk., 2026). This gap poses a direct and immediate threat to the long-term health of public discourse, institutional trust, and democratic stability.

The primary implication for educational policymakers is that current DCE standards require urgent and fundamental reform. Simply appending isolated "media literacy" modules is a demonstrably insufficient response (Padilha dkk., 2025). "Digital Ethics" and "Affective Resilience" must be restructured as core, longitudinal competencies, on par with literacy and numeracy, and integrated across the curriculum.

A profound implication exists for teacher education institutions. The pedagogical gap identified in our interviews is a "training gap" at its source (Uygun, 2026). Pre-service and in-service professional development must be radically redesigned to move beyond technical training and equip educators with the confidence, vocabulary, and pedagogical strategies to teach applied ethics and affective self-regulation.

The pedagogical implication for curriculum designers is the necessary abandonment of purely cognitive-based interventions against disinformation. Instructional models must shift from knowledge transmission (e.g., "what is a deepfake?") to performance-based competency. This includes scenario-based ethical reasoning, metacognitive training in emotional awareness, and practicing "affective friction"—the skill of pausing to regulate an emotional response before engaging cognitively.

A final implication extends to the broader educational technology (EdTech) field. School districts must critically re-evaluate the tools they adopt, questioning if these technologies support or undermine the goals of DCE (Ajani dkk., 2026). The uncritical integration of engagement-driven platforms may inadvertently train students in the very habits of distraction and affective response that DCE seeks to remedy.

These results likely occurred due to significant institutional inertia within educational systems. Curriculum development cycles are notoriously slow, often lagging years behind rapid technological and social change (Abdollahpour Ranjbar dkk., 2026). The current DCE framework is an artifact of the early internet, designed to address "stranger danger" and "cyberbullying," and has not been structurally updated to confront the systemic, psychological threats of platform-scale disinformation.

The affective and ethical domains are studiously avoided because they are difficult to teach and even more difficult to assess (Radičuks dkk., 2026). Unlike a multiple-choice test on technical terms, resilience and ethics are complex, subjective, and context-dependent. Faced with ambiguity and a lack of assessment tools, administrators and teachers default to the measurable, "safe" domains of technical skills and simplistic cognitive fact-checking.

The problem of disinformation has been systemically misdiagnosed by the educational sector. It has been framed as a "knowledge problem" (a deficit of facts) or a "skills problem" (a deficit of verification techniques). Our results suggest it is fundamentally a "human problem"—a vulnerability in our affective, psychological, and ethical reasoning that is being exploited by platform architecture. Our interventions have consistently targeted the wrong vulnerability.

The "affective hijacking" observed in students is the predictable outcome of an asymmetric conflict. Students are educated in a system that prioritizes dispassionate cognition, while existing in a digital ecosystem meticulously designed to provoke and monetize intense emotional arousal (Pereira dkk., 2026). The educational response is simply mismatched in modality and scale to the persuasive power of the digital environment.

Curriculum development must immediately prioritize the creation of a comprehensive, integrated "Ethics and Resilience" (E&R) framework (Radaković & Steingartner, 2026). This framework cannot be a single module but must be developmental, scaffolding from simple digital etiquette in early grades to complex scenario-based ethical dilemmas and metacognitive resilience strategies in secondary school.

Future research must pivot from diagnosis to intervention. The clear failure of existing cognitive-only models necessitates the design and experimental testing of new pedagogical interventions that explicitly integrate ethical reasoning and affective resilience. Longitudinal studies are required to determine if these integrated interventions build lasting, transferable skills.

New assessment tools are urgently needed. To drive curriculum change, we must be able to measure ethics and resilience (Dela Cruz & Dela Cruz, 2026). Future research should focus on developing and validating authentic assessment instruments, such as situational judgment tests (SJTs) and scenario-based protocols, that can measure these higher-order competencies more effectively than self-report scales.

A "whole-school" approach, rather than isolated classes, is essential. We recommend training all educators, from history to science, in the principles of DCE (Anggraheni dkk., 2026). A student's resilience is not built in one class but through a consistent culture of critical

inquiry, ethical reflection, and emotional self-awareness, which must be modeled and reinforced across the entire educational environment.

CONCLUSION

This investigation identified a profound misalignment between the intended curriculum of Digital Citizenship Education and the attained competencies of secondary students. Current educational frameworks demonstrably prioritize technical skills and cognitive-based fact-checking, yet they critically neglect the two competencies essential for the disruptive era: applied digital ethics and affective resilience. The study's distinct finding is that this "affective deficit" represents the primary point of failure; students are emotionally "hijacked" by disinformation before they can apply the cognitive skills they are taught, rendering existing interventions statistically ineffective at building genuine resilience.

The primary contribution of this research is conceptual, offering an "Integrated Ethics and Resilience Framework" as a necessary evolution of DCE. This model moves beyond the field's bifurcation of cognitive-moral reasoning (ethics) and affective-coping mechanisms (resilience). We posit that a robust, internalized ethical framework serves as the essential psychological scaffold upon which sustainable affective resilience is built. By synthesizing these two domains, the study provides a new diagnostic lens and a pedagogical alternative to the prevailing, and failing, cognitive-only interventions.

Certain limitations must be acknowledged, primarily the study's correlational and descriptive mixed-methods design, which identifies deep associations but cannot definitively establish causation between specific pedagogical gaps and student vulnerabilities. The sample was also confined to secondary schools, limiting generalizability to other age groups. Future research must pivot from diagnosis to intervention. Experimental and quasi-experimental studies are critically needed to design, implement, and rigorously assess new curricula built upon the proposed integrated ethics and resilience framework. Longitudinal studies are also essential to track the long-term efficacy of these interventions in building durable, transferable digital citizenship competencies.

AUTHOR CONTRIBUTIONS

Author 1: Conceptualization; Project administration; Validation; Writing - review and editing.
Author 2: Conceptualization; Data curation; In-vestigation.
Author 3: Data curation; Investigation.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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