

Can Critical Pedagogy Survive Algorithmic Constraints?

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Abstract: Educational researchers increasingly explore social media as learning spaces, yet platforms are often shaped by logics of visibility, brevity, and algorithmic amplification rather than sustained dialogue. This paper examines an educational experiment on Instagram that intentionally adopted Freirean design principles (e.g., posing generative questions, organizing content into editorial lines) to cultivate dialogical participation. By qualitatively analyzing 1,056 user comments for epistemic moves (reinterpretation, testimony, comparison) and comparing emergent themes with one year of platform metrics, we identify traces of dialogical engagement emerging alongside platform design changes. This study foregrounds tensions between critical pedagogies and algorithmic social media environments, raising questions about their suitability as learning environments and how learning is designed, enacted, and constrained beyond formal educational settings.

Introduction

Social media platforms have become ubiquitous sites for the circulation of educational content, yet they are rarely designed as learning environments. Research on connected learning (e.g., Ito et al., 2013), participatory knowledge building (e.g., Scardamalia & Bereiter, 2010), and epistemic agency (e.g., Engle, 2006) has demonstrated that learning can occur beyond classrooms when environments are structured to support inquiry and dialogue (and even sometimes when they are not). However, most educational institutions use platforms like Instagram in ways that remain rooted in dissemination models, broadcasting messages to passive audiences (Simis et al., 2016) rather than pursuing overtly educative messaging.

This study critically examines whether and how Freirean principles of dialogue can be enacted within a social media platform designed for visibility, brevity, and virality. Specifically, we investigate the tensions that arise when educators attempt to transform a predominantly monologic medium into a dialogical space. In such a space, a horizontal encounter among subjects, grounded in listening and mutual respect, in which people collectively investigate reality not only to understand the world but to transform it. Between July 2024 and July 2025, the Paulo Freire Initiative Instagram account underwent a deliberate redesign guided by Freirean pedagogy, shifting from standalone posts to curated “editorial lines” intended to provoke collective reflection rather than consumption. We ask: *RQ1: How did the design strategies implemented in the Paulo Freire Initiative Instagram shape forms of dialogical engagement? RQ2: To what extent did these engagements reflect epistemic practices associated with more agentic learning, and where did platform constraints limit such possibilities?* To answer these questions, we qualitatively analyze 1,056 user comments from this time period alongside the account’s platform metrics. Findings suggest that Freirean practices of epistemic agency surface, but platform architectures constrain their dialogical development, implying that critical pedagogies can persist, adapt, or be co-opted within algorithmic social media environments.

Theoretical frameworks

Freirean dialogue and epistemic participation

Freire (1970) conceives dialogue as an ethical, epistemic, and political act grounded in humility, love, and the collective pursuit of knowledge. Freirean dialogue is not merely an exchange of opinions but a co-construction of meaning through problem-posing, critical questioning, and the recognition of human unfinishedness. To engage in dialogue is to name the world, to interpret reality, and through that act, to become capable of transforming it. This relational understanding of knowledge rejects passive reception and positions learners as authors of meaning rather than recipients of information. These principles align with theories of epistemic participation, which view learning as active engagement in communal meaning-making (Engle, 2006; Scardamalia & Bereiter, 2010; Lave & Wenger, 2018). Acts such as elaborating, questioning, interpreting, and comparing perspectives signal a learner’s movement from participation toward authorship. Learning emerges when individuals take intellectual risks, contribute ideas, problematize assumptions, or bring personal experience into shared inquiry (Lave &

Wenger, 2018). Freirean dialogue and epistemic participation converge on a central concern: *under what conditions do people claim the right to think publicly and relationally with others?*

Dialogue in algorithmic environments

The conditions of Freirean pedagogy – dialogue, reciprocity, and critical reflection – can struggle to gain ground in many social media platforms. Instagram, in particular, is governed by algorithmic systems designed to maximize visibility and engagement, rather than sustained inquiry or collective reasoning (Bucher, 2018; Gillespie, 2014; Kent & Taylor, 2021). Content is ranked and circulated based on its capacity to generate rapid responses, which often favors statements of affirmation over acts of questioning or interpretation. While the platform allows users to reply to posts and comments, its design rarely facilitates sustained turn-taking or the cumulative development of ideas. Instead, exchanges tend to become fragmented, with individual remarks circulating in isolation rather than evolving into dialogue. These dynamics position many social media platforms as contested environments for learning (Gutiérrez & Vossoughi, 2010). Educators increasingly inhabit these platforms to share ideas and provoke reflection, yet participation occurs within networked publics: spaces that appear open, but where visibility, memory, and attention are shaped by invisible infrastructural decisions (boyd, 2014; Beigelman, 2014). Emotional responses often receive greater amplification than testimony, reinterpretation, or critique, reinforcing a communicative economy that rewards resonance more than reasoning (Papacharissi, 2010).

Much scholarship on digital participation highlights connection and access, *but less attention has been given to how platform infrastructures constrain epistemic agency and fragment dialogical potential* (Papacharissi, 2010; Tufekci, 2015). This study examines how traces of Freirean dialogue appear within the Paulo Freire Initiative Instagram account. Rather than asking whether learning takes place, we investigate *how users engage in practices such as reinterpretation, testimony, and critique within an environment oriented toward spectacle*. By analyzing these public acts of meaning-making, we explore the tension between pedagogical intention and platform design.

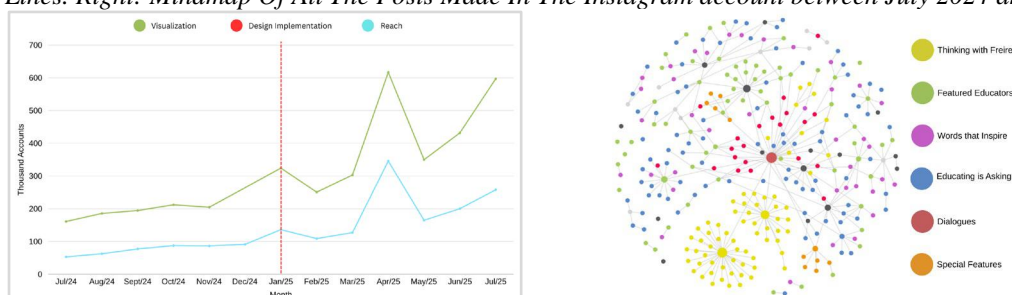
Methods

Design and settings

The Paulo Freire Initiative is an independent social media project created in 2021 to engage Brazilian educators with critical pedagogy. Between July 2024 and July 2025, the Paulo Freire Initiative Instagram account gained 31,171 followers, increasing from 1,240 to 32,411. In January 2025, the team behind the account undertook a deliberate redesign grounded in Freirean principles of dialogue and generative themes. Six editorial lines were introduced (Thinking with Freire, Words that Inspire, Educating is Asking, Dialogues, Featured Educators, and Special Features) to shift the account from sharing inspirational quotations to *structured invitations for collective reflection*. Each editorial followed a recurring format: multi-card posts with opening questions, biographical fragments, paired theorists, or thematic provocations. Rather than presenting finished interpretations, posts ended without closure, intentionally leaving conceptual space for readers to co-author meaning in the comment section. Figure 1 (left) shows metrics for reach (number of unique accounts) and visualization (total views) before and after the implementation of the six editorial lines, and (right) presents a mind map of how the posts' themes are interconnected by editorial line. Engagement peaks aligned with posts combining the new editorial design strategies with controversial educational debates, particularly those touching on political critiques of schooling, which tend to generate higher algorithmic circulation and participation.

Figure 1

Left: Metrics of Reach and Visualization before and after the Design Implementation Of The Six Editorial Lines. Right: Mindmap Of All The Posts Made In The Instagram account between July 2024 and 2025



Data analysis and collection

This study examines one full year of public comments on the Paulo Freire Initiative account (July 2024–July 2025). A total of 1,056 comments were posted and analyzed during this period (418 before and 638 after the design implementation), with an average of 4.31 comments per post. Data were analyzed using an interpretive thematic coding process (Braun & Clarke, 2006) grounded in Freirean dialogical principles and frameworks of epistemic participation (Freire, 1970; Scardamalia & Bereiter, 2010), allowing us to treat the comments as public traces of meaning-making. Three dialogical practices guided the analysis: *Reinterpretation* (Reformulating or extending ideas in relation to lived realities), *Testimony* (Invoking personal or collective experience as epistemic grounding), and *Critical Reflection* (Questioning assumptions, contrasting theories, or naming contradictions). Coding was an iterative process, involving multiple cycles of discussion between two analysts to ensure conceptual alignment. All comments were analyzed not only for their thematic content but also for their stance toward knowledge, i.e., whether users reproduced, revised, or resisted the presented ideas. For example, a comment that connected Freire’s ideas to a teacher’s classroom practice was coded as a reinterpretation because it extended theoretical concepts into lived educational experience. We also examined whether epistemic comments developed into dialogical exchanges (e.g., replies or turn-taking) to distinguish individual participation from sustained dialogue. All data were drawn from public comments; user identities were anonymized.

Findings

Our data analysis identified three main practices within the 1056 comments that showed deeper engagement and more sustained conversation, which represented about 19.7% of the public comments.

- *Reinterpretation of Freire’s Ideas*: Several users reinterpreted Freire’s ideas in relation to their own educational realities. In response to posts emphasizing the importance of study and “unfinishedness,” one user extended Freirean language into institutional critique, asserting, “*This verb to trans-see should underlie political-pedagogical projects, uniting a coherent praxis and transforming the school into a space for constructing knowledge.*” Comments like this suggest a form of epistemic agency, as followers appropriate Freirean vocabulary to articulate positions on curriculum, pedagogy, and educational change. Such reinterpretations typically appeared as individual statements rather than as contributions to a sustained exchange, reflecting the episodic nature of public meaning-making on the platform.
- *Testimony, Memory, Experience, and Belonging*: Testimonial comments were most common in posts referencing Freire’s biography or historical literacy movements. Users frequently situated themselves within broader histories of struggle and pedagogy. One participant wrote, “*My grandfather was one of the 300 who became literate,*” while another shared, “*I first encountered Paulo Freire’s philosophy 29 years ago, and since then I have been an educator.*” These statements served as a public remembrance, affirming both personal and collective identification with Freire’s legacy. Testimony operated as an act of recognition, aligning with Freire’s insistence that memory is central to critical pedagogy. Despite their affective depth, such narratives rarely elicited responses from other users, remaining singular rather than dialogical.
- *Comparison and Critical Reflection*: A smaller but significant subset of comments demonstrated critique or comparison, indicating attempts at dialogical inquiry. In one post discussing models of schooling, a user insisted, “*Technicist education is different from technical training. A real school evaluates and sometimes fails students, just like real life does.*” Another responded sharply to perceived anti-intellectualism: “*It is astonishing to hear a teacher say that ‘philosophy doesn’t work for them.’ Critical thinking is essential to building an advanced society.*” In historically oriented posts, users connected Freire to broader political critique, such as “*Non-education is a project of power, built by those who intend to preserve their privileges.*” These comments revealed tensions between educational ideals and institutional realities, and in a few cases generated brief back-and-forth exchanges. However, these public comments were short-lived, ending before ideas could be collectively developed.

Persistent fragmentation and platform gravity

After the redesign, Freirean epistemic comments (critical reflection, testimony, reinterpretation) tripled, increasing from 54 to 154. While users demonstrated epistemic engagement, their contributions remained primarily parallel, rather than developing into an interwoven dialogue. The majority of comments, however, were affective acknowledgments such as “*What a wonderful post*” and “*Your posts are always incredible.*” These dynamics suggest that while Instagram can host brief moments of epistemic participation, its design and attention economy constrain the emergence of sustained dialogue. Educators and followers may introduce critical discourse, but the platform’s communicative structure renders such efforts fragile and fragmented.

Discussion and conclusions

This study examined whether traces of dialogical practice might emerge within a platform constrained by algorithmic limitations. By examining reinterpretation, testimony, and critical reflection in user comments, we observed instances of epistemic participation associated with knowledge-building and authorship (Engle, 2006; Scardamalia & Bereiter, 2010). However, these engagements often appear as individual gestures rather than as elements of a developing conversation. This fragmentation reflects the dynamics of networked publics, where visibility is shaped by platform infrastructures rather than pedagogical intention (boyd, 2014). Instagram's communicative economy, influenced by affective circulation, tends to reward expressions of resonance, such as affirmation or emotional response, over deliberative exchange (Papacharissi, 2010), making critical engagement visible but not necessarily dialogical.

In response to RQ1, the editorial redesign of the Paulo Freire Initiative Instagram attempted to counter these tendencies by introducing structures that invited reflection, questioning, and reinterpretation. These design choices align with Freire's ideas that dialogue must be *intentionally constructed in spaces where it does not naturally occur* (Freire, 1970). While these editorial strategies succeeded in eliciting more individual acts of reappropriation and critique, they could not significantly overcome the platform's inherent limitations. The reasons go beyond the algorithm itself. Instagram affords personal expression, but its interface and user experience offer limited support for the turn-taking and sustained co-construction of meaning that dialogical pedagogy requires (Bucher, 2018; Gillespie, 2014; boyd, 2014). Comments and replies are not designed for users to follow a conversation, but for brief public comments that get lost in a multitude of other stimuli. Users also revisited the posts as the page evolved into an educational library. Although some users did respond to one another, these exchanges were brief and rarely evolved into sustained dialogue. Most contributions appeared as parallel reflections addressed primarily to the post rather than as turns in a developing conversation. This pattern reflects what Gutiérrez and Vossoughi (2010) describe as contested learning spaces, *where the conditions for epistemic agency are negotiated rather than guaranteed*.

Regarding RQ2, these findings underscore the importance of distinguishing between access to participation, free personal expression, and the presence of sustained dialogical spaces. Although digital platforms are often praised for expanding participation and allowing for the free exchange of information and opinion, these elements alone do not generate epistemic engagement or dialogue (Brady et al., 2023; Perra & Rocha, 2019). Algorithmic infrastructures may enable expression while simultaneously dispersing attention and fragmenting collective sense-making (Bucher, 2018; Tufekci, 2015). Even an account explicitly targeting educators interested in Freirean pedagogy was unable to generate the expected type of dialogue, despite a deep design overhaul. It seems that when critical pedagogy enters such social media environments, the medium becomes the message, and form determines how users interact in the comments. These environments, however, may function less as a stable space for learning and more as a form of resistance: an effort to carve out spaces for critical reflection within architectures that privilege visibility over inquiry. To address this challenge, we created a WhatsApp group and a monthly seminar, both free and open to the community, to foster a more direct and sustained form of dialogue in which design principles are still being tested.

The epistemic moves observed in this study remain significant as expressions of agency and hope (Freire, 1970). They suggest that educators continue to seek ways to name the world, even within conditions that render sustained dialogue elusive. In this sense, the persistence of critical voice within algorithmic constraint may itself be understood as a pedagogical act. Still, they underscore the limitations of these platforms as learning environments and the need for Learning Scientists to recalibrate our hopes and design efforts in repurposing these platforms as dialogical learning environments.

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