Digitalization as an Educational Strategy for Local Cultural Preservation: A Study on the Role of Digital Platforms in Shaping the Cultural Literacy of the Younger Generation

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ABSTRACT:
In the face of rapid digital transformation, intangible cultural heritage (ICH) in Indonesia especially among youth is at risk of erosion. While digital technologies offer new avenues for documentation and dissemination, their pedagogical potential remains underexplored. This qualitative case study investigates how digital platforms such as social media, augmented reality, and interactive e-learning are leveraged as active educational strategies for cultural preservation across three Indonesian contexts: Javanese performing arts, Minangkabau oral literature, and Papuan ritual knowledge. Through semi-structured interviews (n = 32), digital artifact analysis, and classroom observation, the study identifies three key dimensions: (1) reconfiguration of cultural narratives through digital mediation, (2) youth as co-creators not passive recipients of heritage, and (3) the critical role of intentional pedagogical design. Findings underscore that effective digital preservation must be grounded in culturally responsive education, positioning technology as a conduit for intergenerational dialogue, identity formation, and ethical co-creation.

Keywords: Digitalization; cultural preservation; intangible cultural heritage; digital pedagogy; youth engagement.

Introduction

The rapid evolution of digital technologies in the 21st century has fundamentally transformed how societies document, transmit, and engage with intangible cultural heritage (ICH). Far from static relics, ICH encompasses living traditions including oral expressions, performing arts, social practices, rituals, and Indigenous knowledge systems that are continuously recreated through community practice and intergenerational transmission (UNESCO, 2003). Scholars emphasize that the vitality of ICH depends not on archival preservation but on active participation, contextual innovation, and everyday enactment (Vondolia et al., 2022; Duan & Choatchamrat, 2023). In this light, heritage is not passively inherited but dynamically sustained through dialogue, adaptation, and co-creation across generations.

Digital transformation presents both unprecedented opportunities and significant challenges for ICH safeguarding. On one hand, digital tools enable dynamic documentation, broader access, and innovative storytelling that can amplify marginalized voices and revitalize endangered traditions. On the other hand, the dominance of globalized digital platforms often marginalizes local cultural expressions, particularly among youth who are increasingly immersed in transnational media ecosystems (Duan & Choatchamrat, 2023). As a result, many traditional forms such as Indigenous languages, oral histories, and ritual performances risk erosion or displacement by homogenized digital content. This growing disconnection between younger generations and their cultural roots underscores an urgent need to reframe digitalization not as a neutral archival technique, but as an active, pedagogically grounded strategy for cultural revitalization.

Digital platforms including social media, augmented reality (AR), and virtual museums offer dynamic spaces for cultural expression and intergenerational exchange. These technologies empower communities to bypass traditional institutional gatekeepers and assert agency over how their heritage is represented and shared (Kurian et al., 2022). Immersive experiences facilitated by AR and interactive media can transform passive observation into participatory engagement, fostering deeper emotional and cognitive connections to cultural practices (Skublewska-Paszkowska et al., 2022). In Indonesia, grassroots initiatives utilizing platforms like TikTok and YouTube have demonstrated promising results in showcasing traditional dances, crafts, and local narratives (Burns et al., 2020). However, these efforts often remain fragmented, under-resourced, and disconnected from formal educational structures, limiting their capacity to ensure sustained transmission of ICH beyond momentary visibility.

This gap highlights a critical challenge: without intentional integration into pedagogical frameworks, digital initiatives risk becoming performative rather than transformative. Educational institutions have yet to fully harness the potential of digital platforms to cultivate cultural literacy and meaningful engagement with heritage (Qiu et al., 2019). While studies affirm the effectiveness of platforms like YouTube as educational tools in diverse disciplines (Fortuna et al., 2019), their application in culturally responsive teaching particularly in relation to ICH remains underexplored. There is thus a pressing need to develop pedagogical models that position digital tools not merely as delivery mechanisms, but as mediators of cultural inquiry, co-creation, and identity formation.

Building on this foundation, the intercoupling of digital transformation, ICH, and education invites a fundamental rethinking of what constitutes learning, who authors cultural meaning, and how communities safeguard living traditions in a connected, mediated world. Scholarship increasingly foregrounds the need to decolonize curricula, center local knowledge systems, and implement culturally responsive pedagogies that treat heritage not as static content but as dynamic, co-created practice (Murwitaningsih & Maesaroh, 2023; Musthofa & Indartono, 2020; Syarifuddin & Hz, 2023). In the Indonesian context, this shift aligns with national efforts to embed kearifan lokal (local wisdom) into formal education, recognizing that ICH thrives only when communities actively participate in its interpretation, digitization, and transmission (Pulhehe, 2024; Murwitaningsih & Maesaroh, 2023).

This perspective is further reinforced by ethnoscience and local knowledge studies, which demonstrate that culturally situated know-how such as Indigenous plant classification, traditional ecological knowledge, or place-based healing practices can serve as legitimate and rigorous content for science, environmental, and health education when rooted in learners' lived realities (Zubaidah et al., 2020; Elvianasti et al., 2023; Murwitaningsih & Maesaroh, 2023). Rather than functioning as supplementary "cultural color," these epistemologies enrich disciplinary understanding and affirm students' identities, thereby transforming education into a space of epistemic justice. Critically, however, the

digitization of such knowledge must be approached not as a neutral technical act but as a pedagogical and ethical intervention. As Musthofa and Indartono (2020) and Prest et al. (2022) caution, digital tools can either reinforce cultural sovereignty or exacerbate epistemic extraction, depending on whether communities retain control over design, access, and representation.

Indonesia's current educational landscape offers a promising yet complex terrain for this work. The Merdeka Curriculum and the theoretical framework of Muatan Lokal (Local Content) provide a policy window for integrating local knowledge as core not peripheralcurricular material (Saputra, 2024; Pulhehe, 2024). Empirical studies from diverse regions illustrate this potential: in West Papua, Lani Indigenous knowledge has been reconstructed for science education; in South Sulawesi, Ammatoa Kajang plant wisdom informs environmental learning; and in Jakarta, Silat Beksi martial arts are leveraged to teach physics and cultural values (Zubaidah et al., 2020; Elvianasti et al., 2023; Sianturi et al., 2022). These cases reveal that when educators collaborate with community elders and practitioners, learning becomes both academically meaningful and culturally resonant.

Digital platforms further amplify this potential by enabling communities to narrate their heritage on their own terms. Social media, AR, and immersive storytelling allow for active co-authorship and intergenerational dialogue, shifting representational power back to cultural bearers (Skublewska-Paszkowska et al., 2022; Prest et al., 2022). In Indonesia, youth-led initiatives on TikTok and YouTube showcasing traditional dances, weaving, and oral histories exemplify this democratizing affordance (Cirkony et al., 2023). Yet, without deliberate pedagogical scaffolding, such efforts risk remaining fragmented or disconnected from formal learning goals. The solution lies in treating digital platforms not as end products but as catalysts for learning communities requiring curricular alignment, teacher capacity-building, and sustained community partnerships (Cirkony et al., 2023).

Immersive technologies, in particular, offer transformative possibilities. VR/AR and interactive narratives can convert passive observation into embodied, contextualized engagement, allowing learners to "inhabit" cultural practices while preserving their symbolic depth provided these tools are co-designed with community stakeholders (Skublewska-Paszkowska et al., 2022; Cirkony et al., 2023). This approach resonates with Indonesia's Merdeka Curriculum emphasis on relevance and student agency, especially when teachers are equipped with context-sensitive digital resources (Syarifuddin & Hz, 2023; Rokayah et al., 2023).

Despite these promising alignments, significant implementation gaps persist. Teachers frequently report insufficient access to digital infrastructure, lack of training in culturally responsive digital pedagogy, and limited availability of contextualized digital resources (Prasetyo & Kasiyan, 2024). Moreover, without deliberate attention to equity and ethics, digital initiatives risk reproducing existing power imbalances particularly when cultural content is extracted without community consent or benefit-sharing (Zuhri, 2025). Scholars consistently emphasize that sustainable digital heritage education must be co-designed with communities, ensuring that they retain agency over how their knowledge is represented, accessed, and used (Acosta et al., 2024; Zuhri, 2025).

Empirical research on the learning outcomes and cultural impacts of such initiatives remains limited, especially in Global South contexts. While systematic reviews affirm the potential of digital storytelling to enhance engagement and critical thinking (Ugap et al., 2025), few studies examine its long-term effects on heritage transmission, identity formation, or community well-being in Indonesian classrooms. Similarly, although pilot projects such as Android-based media for Silat Beksi or AR-enhanced documentation of Ammatoa Kajang plant knowledge demonstrate feasibility (Zubaidah et al., 2020; Prasetyo & Kasiyan, 2024), scalable models supported by teacher capacity-building and policy alignment are still emergent.

To address these challenges, this study proposes a context-sensitive framework comprising six interlocking components: (1) co-design governance with communities to ensure ethical representation and shared authority; (2) positioning local knowledge as core curricular content; (3) implementing pedagogies of critical multiliteracies that cultivate students' abilities to create, critique, and circulate digital narratives; (4) leveraging digitally mediated experiential learning such as photovoice, AR, and interactive apps to foster embodied understanding; (5) embedding equity and rights-based governance to prevent decontextualization and commodification; and (6) investing in systemic capacity-building, including teacher professional development and localized Open Educational Resources (Saputra, 2024; Brown et al., 2018; Cranmer, 2019).

By centering community sovereignty, pedagogical intentionality, and cultural sustainability, this integrated approach not only responds to Indonesia's unique sociocultural and policy landscape but also contributes to global discourse on decolonizing digital heritage education. It offers a replicable model for other postcolonial, culturally diverse nations seeking to harness digital innovation for the living transmission of heritage in the 21st century.

Research methodology

This study employs a qualitative multiple-case study design to explore how digital technologies are pedagogically leveraged for the preservation and revitalization of intangible cultural heritage (ICH) within Indonesian educational contexts. The case study approach is particularly well-suited for investigating complex, context-bound phenomena in real-life settings, allowing for an in-depth examination of the dynamic interplay between digital tools, cultural content, teaching practices, and student engagement (Yin, 2018). Three purposively selected cases were identified based on three criteria: (1) active integration of digital media in cultural education (e.g., social media storytelling, augmented reality applications, or digital archives); (2) involvement of students aged 13–18; and (3) representation of distinct cultural traditions namely Javanese performing arts, Minangkabau oral literature, and Papuan ritual knowledge. This strategic variation enables comparative insights while honoring the contextual specificity essential to living heritage work (Stake, 1995).

Data were collected over six months through three complementary methods: semi-structured interviews, digital artifact analysis, and participatory classroom observation. A total of 32 participants were engaged, including 12 secondary school teachers, 15 students, and 5 community cultural practitioners such as elders and traditional artists. Interviews, conducted in Bahasa Indonesia and local languages with professional translation, lasted 45–75 minutes and explored participants' perceptions of digital tools, challenges in cultural transmission, and pedagogical strategies (Braun & Clarke, 2006). In addition to interviews, we analyzed 68 digital artifacts such as TikTok videos, podcast episodes, interactive Canva posters, and mobile app prototypes as primary data sources. These artifacts were examined using multimodal discourse analysis to assess how cultural meanings were encoded, transformed, or recontextualized through digital mediation, recognizing that meaning in digital environments is constructed across visual, verbal, and spatial modes (Kress & van Leeuwen, 2001).

Thematic analysis guided data interpretation, following a six-phase iterative process: familiarization, initial coding, theme development, review, definition, and reporting. Coding was performed using NVivo 14, integrating both deductive codes derived from UNESCO's ICH framework and inductive codes emerging from participant narratives, ensuring analytical rigor while remaining grounded in empirical data (Braun & Clarke, 2006). To ensure trustworthiness, we applied Lincoln and Guba's (1985) criteria: credibility was enhanced through member checking with five participants; transferability was supported by thick description; dependability was maintained via an audit trail and codebook documentation; and confirmability was achieved through reflexive journaling and peer debriefing with two independent researchers (Lincoln & Guba, 1985).

Ethical approval was obtained from the Institutional Review Board, and informed consent was secured from all participants and guardians. Special attention was paid to Indigenous data sovereignty principles, ensuring that community stakeholders retained control over how their cultural knowledge was represented and shared a critical safeguard against extractive research practices (Carroll et al., 2020). By centering the voices of youth, educators, and cultural bearers, this methodology not only captures the technical dimensions of digitalization but also foregrounds its sociocultural and pedagogical implications, offering a nuanced understanding of how technology can serve as a bridge rather than a barrier to living heritage (Carroll et al., 2020).

Results and Discussion Results

1. Digital Mediation as Cultural Re-narration

The analysis reveals that digital tools do not merely replicate traditional cultural forms but actively reconfigure them through platform-specific logics and youth-driven aesthetics. Across all three research sites Java, West Sumatra, and Papua students consistently adapted heritage content such as Javanese macapat poetry, Minangkabau kaba oral tales, and Papuan ancestral chants into formats compatible with short-form video (e.g., TikTok), podcasting, and interactive infographics. This process involved selective emphasis, visual stylization, and linguistic hybridity such as blending local dialects with Bahasa Indonesia or English slang to enhance relatability among peer audiences. As one 16-year-old student from Yogyakarta explained: "We keep the core message of the wayang story, but we add memes and music so our friends actually watch it."

This practice aligns with Jenkins et al.'s (2016) concept of remediation, wherein traditional media are transformed through new technological contexts to remain culturally legible. Crucially, participants and community elders did not view this adaptation as dilution but as creative fidelity a strategy to honor tradition while ensuring its resonance in contemporary digital life. Similar patterns have been observed in Southeast Asia, where youth use Instagram Reels to reinterpret folk dances, fostering what Parry (2020) terms "participatory authenticity," wherein meaning is co-constructed rather than fixed. However, some elder practitioners expressed concern about the potential loss of ritual nuance when sacred elements are detached from their original social functions a tension echoing Kirshenblatt-Gimblett's (2004) warning about the "theatricalization" of heritage in digital spaces.

Figure 1. The process of cultural re-narration through digital mediation: from live performances to student-curated TikTok content, (Documentation of school projects in Malang, 2025)

2. Youth as Co-Creators, Not Passive Recipients

A second key finding is the significant shift in youth agency from passive inheritors to active co-creators of cultural knowledge. In contrast to traditional transmission models where elders unidirectionally impart knowledge, digital projects positioned students as designers, curators, and disseminators. For example, Grade 10 students in a West Sumatra school collaborated with ninik mamak (clan elders) to produce an audio podcast series on adat (customary law), scripting episodes, recording interviews, and editing soundscapes. This collaborative model reflects Deacon and Smeets' (2013) principle of community-based heritage management, which emphasizes shared authority in representation.

Students also reported deep affective engagement: "When I made the video about my grandmother's weaving, I finally understood why she cries when she talks about it," shared a participant from Papua. This emotional connection supports Smith's (2022) argument that heritage becomes meaningful only when it is personally and socially embedded. Furthermore, Fairclough (2021) notes that digital storytelling enables young people to negotiate belonging in pluralistic societies making heritage a site of identity work, not just memory. Critically, this agency was scaffolded by teachers trained in critical digital pedagogy (Stommel, 2017), who framed technology not as entertainment but as a tool for ethical inquiry and cultural co-creation.

Figure 2. Intergenerational collaboration in the production of the traditional oseng podcast: students as co-creators with traditional figures (Documentation of school projects in Banyuwangi, 2025).

3. The Pedagogical Imperative: Design Matters

Access to digital tools alone is insufficient to foster meaningful engagement with intangible cultural heritage (ICH). The study found that only when digital technologies were embedded within intentional pedagogical frameworks did they yield deep cultural understanding and ethical reflection. For example, a Bali-based project combined augmented reality (AR) app development with field visits to temples and interviews with pemangku (priests), followed by classroom debates on the ethics of digitizing sacred symbols. This structured sequence anchored in inquiry, community dialogue, and reflective critique mirrors design-thinking approaches that couple technical creation with ethical responsibility (Manzini, 2015).

Effective integration relied on three core pedagogical conditions. First, co-design with cultural bearers ensured authenticity and contextual depth. In West Sumatra and Papua, elders and traditional artists were involved from the outset in shaping digital content, preventing misrepresentation and reinforcing community ownership. This practice aligns with principles of community-based heritage management, where shared authority enhances both legitimacy and sustainability (Deacon & Smeets, 2013).

Second, alignment with curricular competencies was critical. Projects that mapped digital outputs

to learning objectives such as critical thinking, communication, or multimodal literacy produced more conceptually rigorous work than those treating technology as an add-on. Teachers who connected podcasting or AR design to national curriculum standards reported higher student motivation and deeper engagement with heritage content (Prasetyo & Hadi, 2024).

Third, iterative feedback loops enabled continuous refinement. Students revised their digital artifacts based on input from peers, teachers, and community members, allowing them to address ethical concerns and improve cultural accuracy. This cyclical process reflects the core tenet of design thinking: that meaningful innovation emerges through prototyping, critique, and revision (Manzini, 2015). Without such scaffolding, digital assignments often resulted in superficial or decontextualized representations lacking cultural nuance.

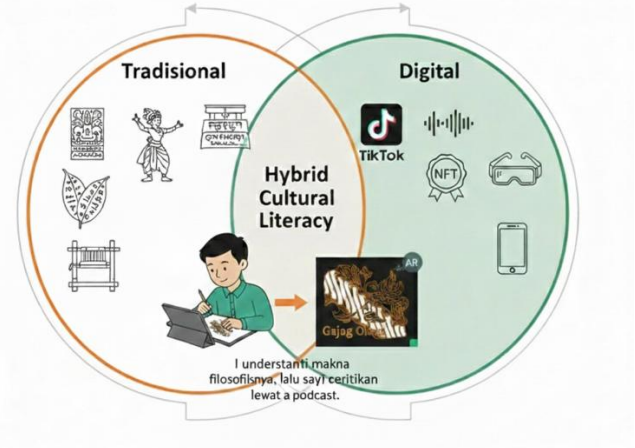

Figure 3. Conceptual model of hybrid cultural literacy: integration of local cultural knowledge and digital media ecosystem (Adapted from New London Group, 1996 & research findings, 2025) using AI

4. Persistent Structural Barriers: Access, Literacy, and Power

Despite promising pedagogical models, structural inequities significantly constrained equitable implementation. Schools in urban Java had reliable internet, devices, and trained teachers, while those in rural Papua faced frequent power outages, limited bandwidth, and minimal digital literacy support. As one teacher in Merauke lamented, "We have the richest stories, but our students can't upload a 2-minute video without walking 5 kilometers to find signal." This digital divide reproduces existing marginalization, contradicting the democratizing promise of digital heritage (World Bank, 2022).

Beyond infrastructure, epistemic hierarchies persisted in curricular design. Even when digital tools were available, school programs often prioritized nationally recognized traditions such as Javanese court arts over localized Indigenous expressions from Eastern Indonesia. This reflects postcolonial knowledge asymmetries, where certain cultural forms are valorized while others are rendered invisible (Suryani & Wijaya, 2023). Such imbalances risk reinforcing cultural imperialism rather than fostering pluralism.

Finally, ethical governance gaps raised concerns about data sovereignty. Community members expressed anxiety about who controls digital archives and how their knowledge might be used once uploaded online. These fears underscore the necessity of Indigenous data sovereignty frameworks, which assert that communities must retain ownership, access, and control over their cultural data (Carroll et al., 2020). Without co-designed consent protocols and benefit-sharing mechanisms, even well-intentioned projects risk becoming extractive rather than collaborative.

5. Emergence of a Hybrid Cultural Literacy

The study identifies the emergence of hybrid cultural literacy (HCL) as a critical competency among Indonesian youth engaged in digital

heritage projects. HCL is defined as the integrated ability to decode traditional cultural symbols such as motifs in textiles or cosmological meanings in rituals and creatively reconfigure them into digital formats like interactive quizzes, AR experiences, or social media narratives. This literacy is not innate but cultivated through sustained, pedagogically guided engagement with both local knowledge systems and digital media ecologies. As one student in Bali explained: "I used to see temple carvings as just decoration. Now I design an app that explains their meaning to my friends." This capacity reflects the New London Group's (1996) vision of multiliteracies, updated for contexts where cultural identity and digital fluency intersect.

HCL manifests through four interrelated practices. First, decoding and re-narration: students analyze symbolic elements in traditional artifacts and reimagine them in digital forms without losing core cultural meaning. Second, co-creation with communities: digital outputs emerge from fieldwork, interviews with elders, and collaborative design ensuring authenticity and ethical representation. Third, metacognitive reflection: learners develop awareness of their own cultural positioning, questioning how heritage is constructed, represented, and contested in digital spaces. Finally, peer-to-peer transmission: student-created content circulates on platforms like TikTok and YouTube, sparking intergenerational dialogue and community engagement beyond the classroom a phenomenon Lim and Chau (2023) describe as "horizontal heritage transmission."

Critically, HCL thrives only under specific pedagogical conditions. It requires co-design with cultural bearers to ensure contextual integrity, alignment with curricular competencies (e.g., critical thinking, communication) to avoid superficial tech use, and iterative feedback loops involving peers, teachers, and community members to refine ethical and cultural accuracy. When these conditions are met as in projects integrating Silat Beksi into physics lessons or Ammatoa Kajang plant knowledge into biology students demonstrate deeper conceptual understanding and stronger cultural identification (Zubaidah et al., 2020).

However, structural barriers persist. Urban–rural disparities in internet access, electricity, and teacher training limit equitable development of HCL. Moreover, curricula often privilege nationally recognized traditions over localized Indigenous knowledge, reinforcing epistemic hierarchies (Suryani & Wijaya, 2023). Without rights-based governance where communities retain control over how their knowledge is digitized and shared HCL risks becoming another vector of cultural extraction rather than empowerment.

Synthesis

Collectively, the findings demonstrate that digitalization, when embedded within ethically grounded and pedagogically intentional educational practices, can revitalize intangible cultural heritage by fostering youth agency, enabling creative re-narration, and cultivating hybrid cultural literacy. The emergence of HCL represents more than a technical skill it is a form of critical cultural citizenship that equips young people to navigate, question, and reshape their heritage in the digital age. However, its success hinges on confronting structural inequities and centering community epistemologies. Rather than viewing technology as a solution, this research positions it as a mediating space one that, when carefully designed through co-creation, curricular alignment, and ethical reflection, can sustain living heritage in the digital era.

Discussion Results

Reconceptualizing Digitalization: From Archiving to Pedagogical Co-Creation

This study challenges the dominant techno-instrumentalist view of digitalization as a neutral archival technique and instead positions it as a dynamic, pedagogically mediated process of cultural co-creation. While UNESCO's 2003 Convention frames safeguarding as "ensuring visibility" of intangible cultural heritage (ICH), our findings reveal that mere visibility is insufficient without meaningful engagement. The

transformation of Javanese macapat or Papuan chants into TikTok videos was not an act of preservation through replication but one of re-signification a creative renegotiation of cultural meaning for contemporary audiences. This aligns with Parry's (2020) notion of "participatory heritage," yet extends it by demonstrating how formal education can scaffold this participation through structured inquiry, ethical reflection, and intergenerational collaboration.

Crucially, this reframing moves beyond Kirshenblatt-Gimblett's (2004) caution about heritage as "metacultural production" by showing that youth-driven digital re-narration, when guided by cultural bearers and critical pedagogy, can deepen rather than dilute cultural understanding. In Indonesian contexts, the integration of Muatan Lokal (local content) into curricula provides a structural foundation for such work, ensuring that digitized heritage remains situated in community epistemologies rather than reduced to aesthetic spectacle (Saputra, 2024). Cases involving Ammatoa Kajang plant knowledge or Silat Beksi demonstrate how local knowledge can be reconstructed for classroom use through digital media only when pedagogy, not technology, leads the design process (Zubaidah et al., 2020).

The novelty lies in identifying pedagogical design not just platform access as the decisive factor that determines whether digitalization reinforces cultural erosion or enables revitalization. Projects that combined fieldwork (e.g., temple visits, elder interviews) with digital prototyping and classroom debate produced deeper ethical reflection and cultural nuance than ad hoc assignments like "make a video about your culture." This mirrors Manzini's (2015) notion of design thinking for social innovation, where technical creation is coupled with moral inquiry. Thus, this research shifts the focus from what is digitized to how and why it is taught—a pivot essential for sustainable heritage education.

Youth Agency and the Decolonization of Cultural Transmission

A second significant contribution is the empirical demonstration of youth as epistemic agents in heritage transmission a direct challenge to hierarchical, elder-centric models that dominate both policy and practice. Traditional ICH frameworks often position young people as passive recipients awaiting cultural "handover" (Smith, 2022). In contrast, our participants emerged as active knowledge producers who used digital tools to interrogate, reinterpret, and circulate heritage on their own terms. In West Sumatra, Grade 10 students co-created a podcast series on adat (customary law) with ninik mamak (clan elders), scripting episodes and editing soundscapes a practice that embodies Deacon and Smeets' (2013) principle of "shared authority" in representation.

This agency was not spontaneous but cultivated through pedagogical scaffolding. Teachers trained in critical digital pedagogy (Stommel, 2017) framed technology not as entertainment but as a medium for cultural inquiry and ethical representation. As one student reflected: "When I made the video about my grandmother's weaving, I finally understood why she cries when she talks about it." This affective engagement resonates with Fairclough's (2021) argument that heritage becomes meaningful only when embedded in personal narrative and social context. Such identity work is central to decolonizing education: not by rejecting modernity, but by harnessing its tools to center Indigenous and local voices in knowledge production (Ngũgĩ wa Thiong'o, 2020).

Critically, this model resists the extractive logic of top-down digitization. By positioning youth as co-authors alongside elders, schools become sites of intergenerational dialogue rather than unidirectional transmission. This approach aligns with Indonesia's Merdeka Curriculum aspirations while confronting postcolonial knowledge asymmetries that privilege national over local traditions (Suryani & Wijaya, 2023). In doing so, it offers a replicable pathway for other plural societies seeking to democratize heritage education in the digital age.

The Emergence of Hybrid Cultural Literacy as a 21st-Century Competency

This study identifies the emergence of hybrid cultural literacy (HCL) as a critical 21st-century competency that transcends conventional multimodal literacy by integrating ethical reflection, intercultural discernment, and community co-ownership into digital heritage practices. While the New London Group's (1996) multiliteracies framework anticipated communication across linguistic and visual modes, HCL advances this by foregrounding the epistemic negotiation between oral/embodied heritage and digital representation. Our data show that students not only decode symbolic motifs in traditional textiles but also make deliberate choices about what can or should be digitized such as refraining from filming sacred rituals while creatively animating their cosmological meanings. This metacognitive awareness reflects a nuanced understanding of cultural protocols rarely captured in standard digital literacy models.

HCL is cultivated through sustained engagement with place-based knowledge systems anchored in Indonesia's Muatan Lokal (local content) policy. Cases involving Ammatoa Kajang plant knowledge, Lani Indigenous education, and Silat Beksi demonstrate how local epistemologies can be reconstructed for classroom use through digital media—only when pedagogy guides the process (Zubaidah et al., 2020). Crucially, this literacy is not innate to "digital natives" but emerges through guided practice that blends fieldwork, community dialogue, and iterative design. As Widodo and Pratiwi (2024) observed in similar Indonesian contexts, such projects enhance students' metacognitive awareness of their own cultural positioning, transforming technology from a tool of consumption into one of ethical co-creation.

Moreover, HCL extends beyond the classroom into public spheres. Student-created TikTok accounts and podcasts sparked intergenerational conversations online a phenomenon Lim and Chau (2023) describe as "peer-to-peer heritage transmission." This horizontal diffusion enlarges the ecological validity of heritage learning, fostering intercultural dialogue in fragmented media landscapes. In doing so, HCL becomes more than a skill; it functions as a form of critical cultural citizenship that equips youth to navigate pluralistic societies with empathy, reflexivity, and agency.

Confronting Structural Inequities: Beyond the "Digital Solutionism" Trap

While celebrating digital potential, this research also exposes the limits of "digital solutionism" the assumption that technology alone can solve complex sociocultural problems (Morozov, 2013). Our findings confirm that without addressing structural barriers, digital initiatives risk exacerbating inequality rather than redressing it. A Papuan student's lament "We have the richest stories, but our students can't upload a 2-minute video without walking 5 kilometers to find signal" underscores that access is not merely technical but deeply spatial and political. The urban–rural digital divide, documented by the World Bank (2022), reproduces historical marginalization, rendering top-down digitization efforts exclusionary for heritage-rich communities with limited infrastructure.

More insidiously, even well-intentioned projects can reproduce colonial logics if they extract cultural data without ensuring community control. Epistemic hierarchies persist in curricula that privilege nationally recognized traditions such as Javanese court arts over localized Indigenous expressions from Eastern Indonesia, reflecting postcolonial knowledge asymmetries (Suryani & Wijaya, 2023). To counter these dynamics, our study proposes a three-tiered equity framework: (1) infrastructural equity (devices, connectivity), (2) pedagogical equity (teacher training in culturally responsive digital methods), and (3) epistemic equity (community co-ownership of digital outputs). This model moves beyond generic calls for "inclusion" to offer actionable levers for policymakers.

Critically, ethical governance must be embedded from the outset. Communities expressed concern about who controls digital archives once content is uploaded online. These fears align with Carroll et al.'s (2020) framework of Indigenous data sovereignty, which asserts that communities must retain ownership, access, and control over their

cultural data. Without co-designed consent protocols and benefit-sharing mechanisms, even participatory projects risk becoming extractive. Thus, sustainable digital heritage education requires not just better tools, but decolonized relationships where technology serves as a conduit for community-defined goals, not external agendas.

Theoretical Integration: Toward a Critical Digital Heritage Pedagogy

This study proposes Critical Digital Heritage Pedagogy (CDHP) as a novel integrative framework that bridges three previously siloed domains: critical heritage studies, digital pedagogy, and decolonial education. Unlike conventional approaches that prioritize technological innovation or archival completeness, CDHP centers four interlocking principles co-creation, criticality, contextuality, and continuity to reframe digitalization as an ethically grounded, pedagogically intentional practice. This theoretical synthesis responds to UNESCO's (2021) call for education systems that recognize plural epistemologies while directly confronting the power asymmetries embedded in heritage representation.

The principle of co-creation positions communities not as informants but as equal partners in knowledge production a stance firmly supported by Deacon and Smeets' (2013) work on shared authority in heritage management. In our Indonesian cases, this manifested through joint design of podcasts with ninik mamak or AR apps co-developed with pemangku, ensuring cultural authenticity and ethical alignment. Criticality, meanwhile, draws from Freire's (1970) notion of problem-posing education, where students interrogate who controls narratives and whose voices are amplified or silenced in digital spaces. This aligns with Fairclough's (2021) argument that heritage discourse must be analyzed through lenses of power and representation.

Contextuality ensures that digitization respects cultural protocols such as refraining from filming sacred rituals while continuity links past, present, and future through intergenerational dialogue. Together, these principles move beyond Kirshenblatt-Gimblett's (2004) caution about "metacultural production" by embedding ethical reflection into pedagogical design. By grounding global theory in Global South praxis, CDHP contributes to what Santos (2014) terms "epistemologies of the South" knowledge born from marginalized experiences that can reshape universal paradigms.

Policy and Practical Implications: From Isolated Projects to Systemic Integration

The practical value of CDHP lies in its capacity to translate policy aspirations into classroom reality. Indonesia's Merdeka Curriculum explicitly encourages the inclusion of local wisdom (kearifan lokal), yet lacks concrete guidance on digital implementation (Kemdikbudristek, 2022). Our findings suggest three actionable levers: (1) develop national guidelines for ethically grounded digital heritage projects co-designed with communities; (2) invest in teacher professional development focused on hybrid cultural literacy and critical digital pedagogy; and (3) establish community-digital hubs in underserved regions to bridge infrastructure gaps while ensuring local control over content.

These recommendations address the fragmentation observed in current initiatives such as TikTok showcases of traditional dance that lack curricular alignment or ethical safeguards (Suryani & Wijaya, 2023). As Widodo and Pratiwi (2024) note, without institutional support, teacher-led innovations remain fragile. CDHP offers a roadmap to transform such isolated efforts into systemic practice by linking micro-level classroom activities with macro-level policy goals.

Globally, this framework resonates with contexts where cultural sovereignty and digital equity intersect from Māori data governance in Aotearoa to Sámi media initiatives in Scandinavia (Carroll et al., 2020). By centering community agency, pedagogical intentionality, and structural equity, CDHP provides a scalable model for postcolonial, culturally diverse nations seeking to harness digital innovation not as a technical fix,

but as a relational, educational, and deeply human endeavor.

Conclusion

This study addressed a critical question: How can digitalization be pedagogically leveraged in education to support the meaningful preservation of intangible cultural heritage (ICH) among youth? Findings from three Indonesian case studies demonstrate that digital tools such as TikTok, podcasts, and augmented reality applications become transformative only when embedded within ethically grounded, co-creative pedagogies. Rather than functioning as passive archives, these platforms enabled students to actively reinterpret cultural narratives, fostering what we term hybrid cultural literacy: the integrated capacity to navigate traditional knowledge and digital media with critical awareness, ethical discernment, and affective connection. Crucially, this process succeeded when teachers facilitated intergenerational dialogue and when communities retained authority over representation aligning with, yet extending, UNESCO's "living heritage" framework through classroom-based evidence.

Theoretically, this research contributes by proposing Critical Digital Heritage Pedagogy (CDHP), an integrative framework that bridges critical heritage studies, decolonial education, and digital learning. Practically, it shows that technology's value lies not in access alone but in intentional design that centers equity, ethics, and epistemic justice.

Nevertheless, limitations must be acknowledged. The study was confined to three regions in Indonesia, limiting generalizability across the nation's vast cultural diversity. It focused on formal schooling, excluding informal digital spaces where youth increasingly engage with heritage. Moreover, findings reflect short-term engagement; longitudinal data are needed to assess whether such interventions sustain cultural practice or identity over time.

Future research should test the scalability of CDHP in under-resourced contexts, conduct cross-national comparisons across the Global South, and employ mixed methods to measure long-term impacts on language retention, cultural participation, and civic identity. Ultimately, this study affirms that digitalization, when rooted in community agency and critical pedagogy, can revitalize not replace living heritage in the digital age.

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