

UNDERSTANDING ANAK DALAM TRIBE STUDENTS' EXPERIENCES WITH DEEP LEARNING-BASED AI-GENERATED VOICE CLONING OF *TUMENGGUNG*

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Abstract

Education for *Suku Anak Dalam* has always represented an encounter between two worlds of knowledge about the modern logic of schooling and the oral wisdom sustained by the spiritual authority of the *Tumenggung*. This study explores that question by integrating AI-generated voice cloning of the *Tumenggung*'s voice into a deep learning-based approach. Drawing on a qualitative approach framed by third-generation Cultural-Historical Activity Theory, we examine how this digital artifact mediates the relationships among teachers, students, and indigenous values. The findings reveal that the *Tumenggung*'s digital voice is not merely a replica, but a cultural dialogue space that rekindles a sense of belonging, fosters affective engagement, and builds epistemic bridges between culture and technology. Ultimately, the study suggests that the essence of educational innovation does not lie in machines that imitate humans, but in humans who rediscover their humanity through technology.

Keywords: AI-EdTech, AI-generated voice cloning, Anak Dalam Tribe, cultural-historical activity theory, deep learning

Introduction

The rapid expansion of AI-generated voice cloning, intelligent tutoring systems, and various forms of AI-EdTech has opened new horizons in teaching and learning, expanding the boundaries of time, space, and human learning experience (Allam et al., 2023; Hamal et al., 2022; Jurcys et al., 2024; Kritandani et al., 2024). Yet, behind this advancement lies an enduring question about how technologies built upon modern rationality interact with educational realities rooted in diverse social and cultural ecosystems (Kamalov et al., 2025; Korteling et al., 2021; Michels, 2024). A fundamental concern, therefore, arises: how can AI serve as a means of empowerment for communities that sustain knowledge through local wisdom, rather than becoming a new instrument?

One of the most tangible representations of this dilemma can be found in the educational realities of indigenous communities, including the *Anak Dalam Tribe* in Jambi, Indonesia. This community maintains a system of values and social structures deeply rooted in spiritual traditions and the charismatic leadership of the



Tumenggung (Rizky & Rahman, 2023; Samsu et al., 2022). Formal education often encounters what can be described as an epistemic wall, a resistance that stems from the incompatibility between the instructional approaches of modern schooling and the cultural logic of indigenous communities (da Silva et al., 2023; Hidayat et al., 2013; Somekh & Nissen, 2011). Many attempts to integrate modern pedagogy into these cultural spaces have failed because they originate from top-down paradigms that marginalize local knowledge authorities (Bone, 2023; Hite et al., 2025). For indigenous learners, education is not a matter of accumulating knowledge but a social practice imbued with spiritual meaning and emotional connection to their environment and communal leaders.

The arrival of AI-generated voice cloning introduces both opportunities and new ethical as well as pedagogical questions. If the voice of the Tumenggung, long regarded as a symbol of authority and cultural legitimacy, can be digitally replicated, could this technology serve as a symbolic bridge that reintroduces the voice of culture into the classroom without erasing its original meaning? Or might it instead become an artificial representation that disrupts the spiritual balance of the community? This debate reflects a broader paradox between two major strands of academic discourse that emphasize AI's potential for educational democratization and social inclusion, and another that warns of its cultural and ethical implications (Baris, 2024; González-Docasal & Álvarez, 2023; Wallin & Tunison, 2022). The gap between these perspectives highlights the need for a theoretical approach capable of fostering a dialogical relationship among humans, culture, and technology.

This paradox also mirrors the dissonance between national educational goals that promote deep learning and the realities of cultural inequality in practice. When modern epistemologies confront collective and spiritual systems of value, a new framework is needed that enables an equal dialogue between technology and local wisdom (Gu, 2021; Harris et al., 2013; Naseer et al., 2024). From this context emerges the idea of bringing the voice of the Tumenggung, the indigenous leader and source of epistemic authority, into learning through AI-generated voice cloning. The presence of the Tumenggung's digital voice represents more than technological innovation; it is an act of recontextualizing deep learning that emphasizes emotional engagement, social relations, and cultural meaning within the learning process (Ali et al., 2025; Gong, 2023; Riomalen et al., 2025; Yuan & Chunrong, 2022).

Some argue that AI can strengthen deep learning by enabling adaptive, personalized, and multisensory learning experiences (Aridan et al., 2025; Naseer et al., 2024). Others are more critical, viewing the trend as a potential source of dehumanization since technology tends to replace rather than enrich the social interactions that are central to meaningful learning (Banh & Strobel, 2023; Bulathwela et al., 2024; Manik et al., 2025). This raises a crucial question: can AI act as a mediating tool that helps students reach a deeper understanding, or does it risk creating a barrier between humans and the humanistic values inherent in learning?

Cultural-Historical Activity Theory (CHAT) provides a conceptual foundation to unpack this complexity. Rooted in Vygotskian thought and expanded by Engeström, CHAT conceptualizes learning as a socially mediated activity shaped by cultural artifacts within specific historical contexts (Clarà, 2015; Cong-

Lem, 2022). Within this framework, technology is not a neutral entity but an integral part of human activity systems that embody values, norms, and power relations. CHAT allows researchers to analyze how AI-generated voice cloning functions as a mediating artifact that connects students, teachers, the Tumenggung, and the indigenous community in a dynamic learning system. From this perspective, technology is not simply a learning aid but a space where cultural values and modernity negotiate and co-construct meaning.

Previous research on AI integration in education (Abulibdeh et al., 2024; Ho, 2025; Kalantzis & Cope, 2024; Perkins, 2023; Tripathi & Yadav, 2025) has largely focused on technological efficiency and cognitive enhancement, while offering little insight into more subtle socio-cultural dimensions such as symbolic authority, emotional experience, and spirituality within indigenous learning environments. Conversely, studies on indigenous education (Bone, 2023; Mangione et al, 2024; Hite et al., 2025; Kovach, 2013; Wallin & Tunison, 2022) rarely consider AI as a productive site of cultural negotiation. It is within this conceptual gap that our study is situated. We aim to understand how AI-generated voice cloning of the Tumenggung mediates literacy learning among Anak Dalam students and how this process shapes their cognitive, affective, and identity-based engagement.

We believe that the success of technology-based education in indigenous education is not determined by algorithmic sophistication but by the extent to which technology can engage in dialogue with the living values of local wisdom. The integration of the Tumenggung's AI-generated voice is not merely a technological innovation but a reflection of humanity's search for meaning in the digital age. It represents an attempt to position technology not as a substitute for human presence but as a means to strengthen the relationship between people, culture, and knowledge. Grounded in the framework of Cultural-Historical Activity Theory, this study seeks to explore how deep learning-based AI-generated voice cloning can become a learning medium that is not only technologically intelligent but also culturally sensitive and pedagogically humanistic.

Method

This research adopted a qualitative case study design framed by Cultural-Historical Activity Theory (CHAT). We selected this approach not only for its theoretical fit but for its ability to view learning as a social activity where every action, symbol, and mediating tool reflects the community's living history and cultural values (Batiibwe, 2019; Sumbera, 2021). The methodology rests on an epistemic awareness that knowledge grows from specific social contexts rather than from a position of neutrality.

This study took place in a public elementary school located near the Anak Dalam Tribe community in Jambi Province. We explored how students engaged with AI-generated voice cloning and how they experienced the Tumenggung's voice as part of learning. For these children, hearing the Tumenggung's voice was not only an educational moment but also a symbolic encounter with the authority of knowledge, where technology mediated the dialogue between tradition and modernity. Participants included 18 students from grades II–VI, two teachers, and the Tumenggung as the key epistemic figure. Participants were purposively selected for their potential to provide rich insights into the learning process. Data were gathered through in-depth interviews, participatory observation, and document

analysis. The interviews focused on students' affective experiences about how they interpreted the digital voice and how it influenced their engagement with literacy. Observations examined classroom dynamics, interaction patterns, and shifts in atmosphere when technology entered as a mediating tool.

Data analysis followed an iterative, dialogical process informed by Miles and Huberman's principles of data reduction, display, and verification (Qomaruddin & Sa'diyah, 2024). Within the CHAT framework, analysis mapped the activity system by identifying subjects, mediating tools, cultural values, and community interpretations of change. Each piece of data was treated as both a representation and a cultural trace, reflecting social and historical meanings embedded in learning. Credibility was strengthened through member checking with teachers and the Tumenggung. This process unfolded as a reflective conversation rather than a formal validation, enabling us to refine interpretations collaboratively. Ethical protocols followed local customs, oral consent was obtained, the digital voice was symbolically approved by the Tumenggung, and all documentation was returned to the community as reciprocal practice.

Throughout the study, we positioned ourselves as part of the learning ecology rather than detached observers. Field reflection became integral to analysis as we, too, were shaped by the experience of hearing the Tumenggung's digital voice and witnessing students' reverence and curiosity. In this sense, methodology evolved into a form of human engagement connecting researcher, technology, and culture.

Ultimately, this research design does not prescribe rigid procedures but seeks to articulate how inquiry can become a dialogue between local wisdom and technological innovation. Studying deep learning-based AI-generated voice cloning within indigenous education is, at its core, a study of humanity of how learning, voice, and meaning are continuously redefined in an increasingly algorithmic world.

Findings and Discussion

The findings were mapped using the third-generation Cultural-Historical Activity Theory (CHAT) framework, which enabled an analysis of interactions between two activity systems: the formal education system and the indigenous cultural system. Within this framework, the integration of AI-generated voice cloning of the Tumenggung's voice served as a mediating artifact bridging both systems and creating a shared object literacy learning that is cognitively, affectively, and culturally meaningful. (Cong-Lem, 2022; Grimalt-Álvaro & Ametller, 2021; Somekh & Nissen, 2011).

Field observations revealed that learning among Anak Dalam students was shaped not only by the pedagogical relationship between teacher and learner but also by the symbolic intervention of the Tumenggung's digital voice, which carried epistemic and spiritual authority. The AI voice thus operated in dual roles, as a modern learning technology that facilitated deep learning and as a cultural representation reinforcing identity and belonging.

Table 1. Mapping of Dual Activity Systems through the Third-Generation CHAT Framework

Element	Formal Education System	Indigenous Cultural System	Interaction / Shared Object
Subject	Teachers and students participating in literacy learning with technology	Tumenggung and community members as sources of cultural authority	Students as boundary agents navigating two epistemic worlds and forming hybrid learning identities
Object	Literacy development through AI-EdTech and deep learning	Transmission of local values, narratives, and wisdom	Transformation of literacy into a culturally grounded learning practice
Tools (Artifacts)	AI-generated voice cloning, audiovisual media, and interactive texts	Oral tradition, native language, spiritual symbols, communal rituals	Tumenggung’s digital voice as a cross-cultural mediating artifact connecting technology and spirituality
Rules	National curriculum, school policy, digital ethics, and learning schedules	Customary norms, spiritual taboos, social order, and traditional communication	Negotiation of ethics and legitimacy between digital and spiritual orders
Community	Teachers, students, principals, technology developers, and educational institutions	Indigenous community, cultural leaders, students’ families, spiritual elders	Collaborative cross-cultural learning community grounded in mutual recognition
Division of Labour	Teachers as facilitators and mediators, students as active learners	Tumenggung as meaning source, community as value custodian	Redistribution of knowledge authority toward epistemic partnership
Outcome	Enhanced literacy, active participation, and openness to technology	Strengthened cultural identity and community pride	Deep learning that integrates cognitive, affective, and cultural dimensions reflectively and transformatively

Empirically, the integration of AI-generated voice cloning transformed students’ learning structures. Students displayed heightened engagement, enthusiasm, and reflective depth when listening to the digital voice of the Tumenggung. The voice was perceived not only as a learning medium but as a symbolic presence legitimizing school-based activities within a cultural frame. This created a boundary zone between modern schooling and indigenous epistemology, a shared space where knowledge was collaboratively produced across cultural borders.

The findings affirm that success in integrating technology within indigenous education is not defined by technical sophistication but by the technology’s ability to act as social and cultural mediation. Through the Tumenggung’s AI voice, the two systems—formal and indigenous- are intertwined to form a reflective and transformative learning practice grounded in living human values.

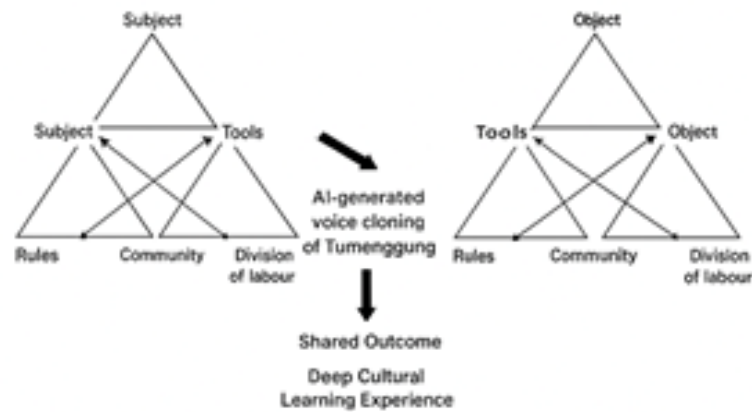


Figure 1. Representation of Interacting Activity Systems

The Tumenggung’s digital voice functioned not merely as an instructional tool but as a cultural artifact representing the intersection of technology and tradition. For the Anak Dalam community, voice is not only a medium of communication but a vessel of value, knowledge, and spirituality. When replicated through AI, it reconfigured the epistemic space where embodied authority is represented in digital form, yet still retains symbolic and spiritual power.

These findings align with Agrawal (2023) and Gidiotis & Hrastinski (2024) who argue that artificial intelligence always intertwines with the social values that shape its use. The Tumenggung’s voice extends the notion of mediation, showing that no learning artifact is neutral, as each carries embedded values, norms, and power relations (Ross et al., 2022). The cloned voice thus emerges as a negotiated space where cultural identity and digital modernity meet to construct new understandings of learning.

Students' encounters with the AI-generated voice elicited strong emotional responses. Many described the experience as if the Tumenggung were physically present, a symbolic form of presence that fostered emotional closeness and deepened engagement. This reinforces prior studies (Ho, 2025; Qin et al., 2022; Schneider et al., 2022) which highlight how emotional presence in digital learning enhances engagement and comprehension. A familiar and respected voice created intimacy in the classroom, transforming technology into a bridge that revived collective values in modern learning spaces.

At the same time, epistemic tension emerged. Some teachers and community members questioned the authenticity of a replicated voice and its right to represent the Tumenggung’s original authority. This raised critical issues of authenticity and representation often overlooked in technology-driven education. Ejjami (2024) warns that modern biases in AI risk positioning algorithms as new sources of truth. Yet, in this study, such tension proved productive but encouraged reflection and dialogue about presence, authority, and meaning in learning.

The digital voice of the Tumenggung reveals that the value of innovation lies not in how precisely technology imitates humanity, but in how it sustains dialogue where cultural values continue to breathe amid digital change. This research expands the CHAT framework by showing that mediating artifacts can be material, social, emotional, and spiritual. Learning mediated by the Tumenggung’s AI voice

demonstrates that technology can serve as a connector between tradition and renewal, a means of preserving cultural continuity through learning grounded in reflection, reverence, and shared humanity.

Multi-Voicedness and Negotiation of Meaning Across Activities

The integration of the Tumenggung's AI-generated voice created a dynamic interaction among three main activity systems: teachers, students, and the indigenous community. These systems did not operate linearly but influenced one another in constructing new understandings of learning. This phenomenon reflects the principle of multi-voicedness, where each system brings distinct goals and values while striving toward a shared outcome. Within the Anak Dalam learning space, the coexistence of these voices produced not conflict but a new harmony rooted in ongoing negotiation between local wisdom and technological innovation.

Teachers viewed the AI voice as a pedagogical bridge connecting school and community. For students, it reintroduced a familiar and respected figure, strengthening emotional engagement and cultural belonging. Meanwhile, the community responded ambivalently about appreciating the recognition of their culture within schooling, yet was concerned about the potential dilution of spiritual meaning through digital replication. This tension formed a discursive arena where authority, authenticity, and knowledge were continuously redefined.

As Murtaqiatusholihat et al. (2023) emphasizes, authentic learning arises from dialogue among multiple value systems rather than dominance by one. The intersection between indigenous epistemology and technological logic demonstrated that actors within the Anak Dalam education context were able to create a reflective and adaptive learning community. This resonates with Selasih & Sudarsana (2018) who found that successful technology integration depends on a society's ability to renegotiate meaning while remaining culturally grounded.

The phenomenon of multi-voicedness also challenges the traditional notion of the teacher as the central authority. Within this expanded system, authority becomes distributed; the teacher mediates learning, the digital Tumenggung provides cultural legitimacy, and students interpret experience through their own understanding. This process illustrates expansive learning, in which knowledge emerges through cross-role collaboration rather than one-way transfer (Guberman et al., 2021; Guberman & Smith, 2021).

Ultimately, the presence of the AI-generated Tumenggung demonstrates that technology can broaden participation in indigenous education without eroding collective identity. The negotiation among these actors signals not fragmentation but transformation as an evolution toward dialogic and inclusive learning. The AI voice thus becomes a living site of negotiation where local values, modern pedagogy, and digital knowledge intersect to create renewed meanings of learning. It models a form of education that transcends the binary between tradition and modernity, showing that amid epistemic tension, technology can nurture dialogue and enrich human understanding.

Transformation of the Subject and Expansion of the Learning Zone

This study reveals that the Tumenggung's digital voice shifted learners from passive recipients to active participants engaged in reflection and meaning-making. Students no longer merely listened; instead, they negotiated the meanings of a voice

they recognized and respected. This shift reflects the central principle of third-generation CHAT, where the subject transforms through interaction with mediating tools and social communities (Grimalt-Álvaro & Ametller, 2021). AI here functions not only as a technological aid but as a medium for new awareness, guiding students to connect identity, culture, and knowledge.

The AI-generated voice created a reflective space where students experienced cultural values personally and emotionally. Learning became deeper as it moved beyond formal instruction toward symbolic engagement that evoked a sense of ownership of knowledge based concept of deep learning, where understanding emerges when new information connects with one's lived values and experiences (Andayanie et al., 2025; Riomalen et al., 2025).

This transformation also reshaped the roles of teachers and the community. Teachers repositioned themselves as facilitators navigating between modern and local epistemologies. They learned how technology could revive hidden cultural meanings within formal education. Meanwhile, the indigenous community found new ways to preserve their heritage through symbolic integration into school learning. The digital voice of the Tumenggung became an intergenerational bridge, sustaining tradition while embracing change.

Through this integration, learning among Anak Dalam students evolved into a space where technology and local values enrich one another. AI reintroduced spiritual and social experiences once accessible only through the direct presence of the Tumenggung. In this sense, students learned not only academic content but also to rediscover their cultural roots and sense of identity. This represents the essence of deep learning, where knowledge is not only understood but also lived and shared.

Contradictions, Tensions, and Transformation of the Activity System

The integration of the Tumenggung's AI-generated voice unfolded not as a linear process but through a series of contradictions and tensions that reshaped the entire learning system. These tensions emerged across layers between spiritual values and technological rationality, between traditional authority and formal schooling, and between community expectations and modern pedagogical standards (Kovach, 2013; Shaikh & Hossen, 2025). Rather than obstacles, such contradictions became catalysts for transformation, illustrating that growth within an activity system arises through the effort to resolve internal conflicts.

Teachers and students played key roles in bridging differences between cultural and technological logics. Teachers who once acted as controllers of learning were challenged to engage with the emotional and spiritual dimensions evoked by the Tumenggung's digital presence. They faced epistemological dilemmas in balancing cultural authenticity and pedagogical goals, yet gradually discovered that the AI voice fostered emotional closeness and engagement otherwise difficult to achieve.

Within the indigenous community, tension centered on the authenticity of representation. Some feared that reproducing the Tumenggung's voice might diminish its sacredness, while others regarded it as a respectful way to preserve heritage in digital form. Such debates affirm that cultural adaptation to technology is never neutral; it involves negotiation of meaning and power. Through sustained dialogue, the community came to view AI not as a threat but as a means to ensure that indigenous values remain vital within modern education. Students, meanwhile,

moved from initial ambivalence between awe and unease to perceiving the digital voice as a symbolic presence that enabled deeper reflection. The idea of contradictory expansion, where internal conflict produces new understanding and extends the learning horizon.

From a broader systemic view, tension among subjects, tools, and the community generated expansive transformation. Teachers, students, and community members collaboratively redefined education as a practice grounded in cultural values yet open to renewal. Contradiction, therefore, is not a symptom of failure but a sign of evolution toward higher awareness and complexity. The sustainability of AI-based education in indigenous contexts depends less on technical efficiency than on the social system's ability to adapt and reflect. Tension must be embraced as a source of learning energy, for the AI-generated voice ultimately mirrors the ongoing dialogue between humanity, culture, and knowledge, reminding us that authentic education grows from the meeting of the sacred and the digital, the inherited and the reimagined.

Expansive Learning Cycle and Reconfiguration of Pedagogical Practice

The integration of the Tumenggung's digital voice within the Anak Dalam learning process unfolded as a journey of shared reflection. The expansive learning cycle, where transformation grows from tension and dialogue rather than from linear progress. The first spark came from the meeting of two epistemic worlds: the sacred oral tradition and its digital reproduction. This moment of contradiction urged teachers, students, and community members to pause, question, and rediscover what it truly means to learn together. Through this collective reflection, they began shaping new ways of teaching and learning that honored both technological possibility and cultural meaning.

At first, teachers saw the AI voice merely as a tool to make lessons more engaging. Over time, however, they realized that the presence of the Tumenggung's voice was not simply functional but challenged their old assumptions about knowledge and authority. Teaching became less about transferring content and more about building understanding through shared dialogue. The community, too, found its voice in this process. Through discussion and participation, they reimagined the sacred, recognizing that technology could help preserve their wisdom without hollowing its spiritual depth. In this way, learning extended beyond the classroom, forming a living network that connected teachers, students, technology, and culture.

For students, this journey was deeply personal. Listening to the Tumenggung's AI voice invited them to see learning as part of who they are, not just what they do. They experienced what Rulyansah et al. (2025) and Hutapea et al. (2024) describes as transformative engagement, where understanding touches identity and emotion as much as cognition. Reading and writing became acts of remembering and belonging. From this experience grew a new kind of pedagogy that uses AI not to replace human presence, but to spark conversation and care. Teachers began drawing on cultural narratives, the community contributed stories and voices, and students learned to connect knowledge with life. In this ecology of learning, technology and tradition no longer stand apart; they breathe together, renewing both education and the meanings that hold it alive.

Implications for CHAT and Indigenous Education

Within the framework of CHAT, the integration of the Tumenggung's AI-generated voice should be viewed not simply as the use of a digital artifact but as the creation of a new activity system that mediates relationships among subjects, communities, and cultural values. This process illustrates how technology can act as a cultural mediator that brings spiritual and social meaning into contemporary learning contexts while maintaining the integrity of traditional authority. Rather than functioning as an external or neutral tool, the technology becomes part of a living dialogue between knowledge, culture, and human experience.

From a theoretical perspective, this study expands the scope of CHAT beyond its traditional applications in school and workplace settings by positioning indigenous education as a distinctive epistemic domain. Third-generation CHAT emphasizes the importance of dialogue between intersecting systems of activity. In this research, the modern school and the indigenous community interact through the mediation of AI, producing a hybrid form of learning that challenges the long-standing separation between modernity and tradition. These findings suggest that activity theory should also account for how technological tools participate in the negotiation of values and meaning within cultural systems.

From an epistemological standpoint, the findings demonstrate that knowledge is not produced by a single, autonomous source, but emerges through reflective interactions among people, artifacts, and the social world in which they are embedded. The presence of the Tumenggung's digital voice disrupts the conventional boundary between indigenous and modern epistemologies, giving rise to epistemic hybridity. In this space of convergence, students develop not only literacy skills but also an awareness that learning is a social act connected to their cultural and emotional identities. The findings, therefore, highlight that AI can serve as a medium through which learners experience and reinterpret their heritage in meaningful ways.

Conceptually, this study contributes to the development of a decolonial approach to AI pedagogy by illustrating how technology can strengthen rather than replace local ways of knowing. When students from the Suku Anak Dalam learn through the familiar voice and symbols of their own culture, technology becomes a means of cultural affirmation and empowerment. The study thus reinforces the view that meaningful integration of AI in education depends not on algorithmic sophistication but on the capacity of technology to resonate with human values and communal life. A culturally responsive CHAT perspective shows that when used ethically and reflectively, technology can connect modern learning with the wisdom of tradition, offering new possibilities for education that remain grounded in humanity.

Conclusion

This study affirms that the integration of deep learning-based AI-generated voice cloning of the Tumenggung into the learning process of Anak Dalam students represents not merely a technological innovation but an epistemic dialogue between modernity and indigenous wisdom. Through the lens of CHAT Theory, we found that the Tumenggung's digital voice serves as a mediating artifact that connects cognitive, affective, and cultural dimensions within a dynamic system of learning activity. This process creates a learning space that not only enhances students'

engagement and intrinsic motivation but also restores cultural authority within the formal education system, which has often marginalized local values. Practically, the findings suggest that the success of technology-based education in indigenous education depends less on algorithmic sophistication and more on the technology's ability to resonate with the value systems and social relations that sustain the community. Theoretically, this research expands the horizon of CHAT by situating indigenous education as a new epistemic domain that challenges the long-standing dichotomy between humans, culture, and machines. Furthermore, the ethical and sustainability dimensions of using AI voice cloning in educational spaces warrant further inquiry, particularly concerning cultural autonomy and the potential commodification of vocal identity.

Future research could extend this work by exploring cross-community comparisons, examining the negotiation of meaning between human and non-human actors, and developing more participatory models of AI-human collaborative pedagogy that remain sensitive to cultural contexts. In conclusion, this research should not be seen merely as an experiment in technological integration but as an effort to cultivate new awareness that education in the age of artificial intelligence demands a balance between innovation and wisdom. The AI-generated voice of the Tumenggung is not a symbol of dehumanization but an entry point into a renewed form of dialogue among humans, culture, and technology in the shared pursuit of meaningful learning.

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