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Impact and Adaptability of Conventional Blended Learning Strategies in Enhancing Student Motivation a Qualitative Investigation of Unplugged Pedagogy in Boarding Schools with Restricted IT Facilities

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ABSTRACT

This research investigates the conflict between the Merdeka Curriculum's goal of learner autonomy and the strict device-free policies of military-based schools facing severe ICT scarcity. Utilizing an instrumental qualitative case study, the study reveals an asymmetrical blended model, or unplugged pedagogy, centered on intensive analog instruction and strategically restricted IT use (Hadi & Anwar, 2025; Husen et al., 2025). While this model successfully promotes cognitive focus and fulfills needs for competence and relatedness (Ryan & Deci, 2020), the resulting constraint on informational access severely limits autonomy, generating a critical pedagogical paradox (Maufiroh et al., 2025). The findings underscore teaching resilience (Syarifuddin & Saparuddin, 2021) and mandate policy reform to balance security with controlled ICT access, providing a vital blueprint for resource-constrained contexts like Indonesia's 3T regions (Rasheed et al., 2020).

***Keywords**: Unplugged Pedagogy, Blended Learning Adaptation, Student Motivation, ICT-Limited Education, Merdeka Curriculum*

INTRODUCTION

The contemporary educational paradigm, exemplified by the Indonesian Merdeka Curriculum, requires students to actively source information, maintain a student-centered approach, and develop autonomous competencies (Suryani, 2023; Rahmawatie et al., 2025). This mandate aligns with the global movement toward implementing Blended Learning (BL), conventionally defined as integrating face-to-face instruction with technology-mediated online activities (Garrison & Vaughan, 2020; Hrastinski, 2019). A critical contradiction emerges, however, when this digital imperative clashes with specific institutional realities, particularly in military-based boarding schools. These institutions strictly enforce a device-free pedagogy, heavily restricting personal electronic devices (allowing usage for only $\approx 2-3$ hours on weekends/holidays) and providing minimal Information and Communication Technology (ICT)

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infrastructure, such as only one online TV in the main hall and one projector (Field Findings Data). This severe limitation, symptomatic of an acute digital divide (Rachmawati et al., 2023), actively impedes students' mandated 'independent exploration' under the Merdeka Curriculum, subsequently reverting instruction to a teacher-centered mode (Syarifuddin & Saparuddin, 2021). Therefore, an investigation into adaptive strategies arising from this structural conflict is urgently required.

Current research largely confirms that technology-enhanced blended learning significantly boosts student learning motivation and engagement, primarily by increasing autonomy and flexibility (Pohan et al., 2024; Rasheed et al., 2020). This enhanced motivation is strongly connected to the satisfaction of fundamental psychological needs—namely autonomy, competence, and relatedness—as elucidated by the Self-Determination Theory (SDT) (Ryan & Deci, 2020). Studies examining the impact of device restrictions offer mixed findings: strict device bans can improve cognitive focus in the classroom (Chang et al., 2022; Tjahjadi et al., 2023), but extreme limitations concurrently obstruct access to information and hinder learning independence (Kurniawati, 2020).

Existing literature on unplugged pedagogy (non-digital learning) predominantly concentrates on developing computational thinking skills without computers (e.g., creating algorithms using cards), often disconnected from the broader blended learning context (Huang & Looi, 2020; Fehr et al., 2021). The central limitation in these studies is the inherent assumption that blended learning necessitates adequate digital technology (Graham et al., 2022). Given empirical data indicating that Indonesian boarding/military schools continue to grapple with severe ICT infrastructure limitations (Husen et al., 2025; Maufiroh et al., 2025), the bulk of digital blended learning research lacks contextual relevance. This gap necessitates a focus on the mechanisms of pedagogical adaptation within structurally unplugged environments.

The academic lacuna lies in understanding how conventional blended learning strategies—combining core face-to-face instruction with analog independent assignments utilizing printed books and hardcopy materials—supported by minimal IT facilities (a single TV/projector), function as an adaptive form of unplugged pedagogy in IT-constrained settings (Hadi & Anwar, 2025). This non-digital model, imposed by school policy (device ban) and infrastructural scarcity, generates a direct conflict with the Merdeka Curriculum's mandate for independent exploration (Rachmawati et al., 2023). Crucially, there is a lack of qualitative frameworks analyzing the impact of this extreme unplugged adaptability model on student motivation, specifically regarding the fulfillment of their needs for autonomy and competence (Ryan & Deci, 2020). This study aims to address this deficit by providing a conceptual framework for a non-digital blended learning model.

Based on the gap analysis, the core research question is: How are conventional blended learning strategies adapted as an unplugged pedagogy in military-based boarding schools with severely limited IT facilities, and how does this adaptive model qualitatively influence and enhance student learning motivation? The objectives are: (1) To analyze the teachers' model of adaptation; (2) To describe the implementation of unplugged pedagogy within highly constrained IT settings; and (3) To investigate the impact of these adaptations on student motivation. The Novelty of this research lies in its in-depth qualitative case study of Critical Unplugged Pedagogy—an analog blended learning model emerging as a direct response to extreme IT restrictions and curricular conflict. This offers a significant contribution to the theoretical framework of pedagogical adaptation in resource-limited settings, specifically within Indonesian boarding/military schools.

This study is important due to the growing mismatch between curriculum policy and institutional practice in Indonesian education. While the Merdeka Curriculum promotes student autonomy and independent inquiry, many boarding and military-based schools impose strict device restrictions and face severe ICT limitations. This contradiction risks reducing the effectiveness of curriculum implementation and may hinder students' development of independent learning skills. Therefore, examining how teachers adapt blended learning strategies in such constrained environments is essential for ensuring that educational objectives remain achievable. This research contributes by providing empirical insights into pedagogical adaptation in ICT-limited contexts and offering a relevant framework for similar institutions (Rasheed et al., 2020; Rahmawatie et al., 2025).

METHODS

This investigation is anchored in a Qualitative Research paradigm, employing an Instrumental Case Study approach (Creswell & Poth, 2020; Stake, 2005). The choice of an instrumental design is strategic: rather than focusing solely on the unique characteristics of the site, the military-affiliated residential school(s) serve as a bounded context used to illuminate the overarching theoretical concern specifically, how pedagogical practices are adapted and maintained amidst extreme technological restrictions. The primary objective is to develop transferable insights regarding instructional resilience in low-ICT environments, not merely to describe the schools themselves.

This study was conducted in a military-based boarding school in Indonesia characterized by strict device-free policies and limited ICT infrastructure. A total of 15 participants were involved in this research, consisting of 5 teachers, 7 senior students (Grade XI and XII), and 3 school administrators. The participants were selected using purposive sampling, based on their direct involvement in the teaching and learning process within the constrained educational setting.

The data collection process was carried out in several stages. First, formal permission was obtained from the school administration. Second, semi-structured interviews were conducted with teachers, students, and administrators to gather in-depth information. Third, non-participant observations were conducted during classroom activities to capture real teaching and learning practices. Finally, institutional documents were collected and analyzed to support and validate the findings. This systematic procedure ensured comprehensive and credible data collection (Creswell & Poth, 2020).

The participants in this study were strategically selected using purposive sampling, a technique intended to identify individuals who possess rich and firsthand knowledge relevant to the research phenomenon (Merriam & Tisdell, 2016). The final participant cohort consisted of three key groups to ensure comprehensive data triangulation. The first group comprised core subject instructors, who were responsible for the daily delivery of the curriculum. These participants served as essential sources of information regarding practical adaptive teaching strategies, challenges related to curriculum compliance, and the allocation and management of limited information technology resources, such as the use of a single projector or television unit in the classroom. The second group included senior students from Grade XI and Grade XII, whose perspectives provided important experiential data concerning the implementation of the device-free policy. Their insights contributed to understanding how the policy influenced learning motivation, self-regulated learning capacity, autonomy, and feelings of frustration, as highlighted by Richard M. Ryan and Edward L.

Deci (2020). The third group consisted of school administrators and policy makers, who provided the official institutional rationale underlying the strict technology limitations, thereby offering important contextual information regarding the implementation and objectives of the policy.

The data gathering process was conducted systematically and commenced only after obtaining the necessary ethical and institutional permissions. To enhance the depth, credibility, and rigor of the findings, the study employed a robust mixed-method data collection strategy. The primary method involved semi-structured interviews aimed at generating rich and detailed descriptions of participants' experiences and perspectives. Through these interviews, teachers discussed their adaptive pedagogical strategies and the logistical challenges encountered in utilizing limited digital equipment within the classroom environment. Meanwhile, students explained their coping mechanisms in managing independent learning within a device-free setting, while school administrators elaborated on the institutional philosophy and rationale underlying the restrictions on personal digital devices.

In addition to interviews, focused non-participant observations were conducted during periods of intensive instructional activity. The observations specifically concentrated on two principal aspects. First, the observations documented the teachers' instructional implementation in real classroom settings, particularly how limited technological resources, such as a single-unit IT device, were optimized to support the teaching and learning process. Second, the observations examined students' actual practices in retrieving external information, completing learning tasks, and engaging in classroom activities within the constraints of a device-free environment.

Furthermore, institutional document analysis was carried out to provide additional contextual evidence supporting the research findings. This process involved examining official school documents, including the procedures related to the implementation of the Merdeka Curriculum and internal policy manuals regulating student access to personal devices and the use of information and communication technology (ICT) infrastructure within the school. The analysis of these documents served to verify the consistency between the institutional justifications presented by participants and the written policies formally established by the school.

The collected data underwent a rigorous process of reduction, display, and ultimate conclusion drawing (Miles, Huberman, & Saldaña, 2020). The primary analytical technique applied was Reflexive Thematic Analysis (TA) (Braun & Clarke, 2021). This method was utilized to identify, analyze, and interpret underlying patterns (themes) concerning the adaptive pedagogy, the nature of institutional-pedagogical conflict, and the resultant impacts on student motivation, ensuring that the final interpretations were solidly grounded in the verbatim accounts of the participants.

The analysis followed a step-by-step thematic analysis approach. First, all interview data were transcribed and read repeatedly to achieve data familiarization. Second, initial codes were generated to identify meaningful patterns. Third, the codes were grouped into categories and themes. Finally, the themes were interpreted in relation to the research questions to explain the phenomenon of pedagogical adaptation and its impact on student motivation. This approach ensures systematic interpretation and transparency in qualitative analysis (Braun & Clarke, 2021).

To guarantee the trustworthiness and rigor of the qualitative findings, several established verification strategies were implemented, as suggested by Yvonna S. Lincoln and Egon G. Guba (1985), as well as Janice M. Morse (2015). One of the primary strategies employed was triangulation, in which findings obtained from teacher interviews, student narratives, administrative accounts,

observations, and institutional policy documents were systematically cross-referenced and compared to ensure consistency and comprehensiveness of the data. Through this approach, the researchers were able to validate information from multiple perspectives and strengthen the credibility of the study findings. In addition, member-checking was conducted by returning preliminary themes and final interpretations to the participants for review and validation. This process ensured that the researcher's interpretations accurately reflected the participants' lived experiences, perspectives, and intended meanings. To further ensure the credibility and validity of the findings, the study consistently applied triangulation throughout the research process by integrating multiple data sources and comparing the evidence obtained from interviews, observations, and document analysis.

comparing data from interviews, observations, and documents. Member checking was also conducted by returning the findings to participants for validation. These strategies strengthen the reliability and accuracy of the interpretation (Lincoln & Guba, 1985).

RESULTS

1. Summary of Themes and Sub-Themes

The results of the thematic analysis are summarized in Table 1, which presents the main themes and sub-themes derived from the data (Braun & Clarke, 2021).

Table 1. Summary of Themes and Sub-Themes

Themes	Sub-Themes
ICT Constraints	Limited devices, restricted access
Pedagogical Adaptation	Analog learning, teacher-centered approach
Positive Motivation	Increased focus, deep learning
Negative Motivation	Limited autonomy, restricted exploration
Social Skills Development	Collaboration, communication

Table 1 presents the summary of themes and sub-themes generated from the thematic analysis process, reflecting key patterns identified from the interview, observation, and document data (Braun & Clarke, 2021).

2. Strategic Management of Severely Constrained and Infrequent IT Access

The foundational structure of the pedagogical model was built upon the necessity of strategic management of minimal and restrictive Information Technology (IT) resources. The investigation confirmed that the utilization of the singular projection unit and the communal digital display (situated outside the regular classroom environment) was tightly controlled, obtainable only after successfully navigating a protracted and cumbersome bureaucratic authorization protocol (Husen et al., 2025). This institutional hurdle imposed severe limitations on utilization time. In response, core subject instructors innovated micro-optimization tactics, meticulously curating digital content to focus exclusively on highly impactful, irreplaceable visuals within the allotted, brief timeframes. This operational necessity did not represent a choice for technology integration; rather, it emphasized the acute implementation challenges characteristic of infrastructural scarcity in blended learning environments (Rasheed et al., 2020). The entire operational focus thus shifted from the principle of technological integration toward a practice of rationing access to a non-negotiable scarcity.

In an environment defined by the near-absolute prohibition of personal student electronic devices, the instructional default was a heavy reliance on Unplugged Pedagogy (Huang & Looi, 2020). The data consistently demonstrated that a substantial proportionapproaching 95% of scheduled instructional time was conducted non-digitally, mandating a complete pivot toward analog educational resources. This resource shift encompassed the intensive, compulsory consultation of physical print textbooks, the analysis of analog case materials, extensive use of Socratic discourse (emphasizing sophisticated oral communication skills), and assignment structures that demanded strictly manual and hands-on completion. This profound dependence on verbal interaction and manual task execution stands in significant contrast to the pervasive emphasis on digital literacy and contemporary skill acquisition goals central to many global educational policies. The model functionally institutionalized a learning process focused on analog deep work.

The specific nature of 'blending' identified in this setting represented a major divergence from standard contemporary technology-driven blended models (Garrison & Vaughan, 2020). Qualitative analysis indicated that the faculty conceptualized their instructional blend not as a mix of online and physical, but as a potent and seamless fusion of high-density, Core Face-to-Face Interaction immediately followed by Structured, Book-Based Independent Study (Hadi & Anwar, 2025). This framework constitutes a distinctly asymmetrical approach: it systematically substitutes the online, asynchronous components expected in modern blended learning (Graham et al., 2022) with a mandate for deep, print-based self-study. This effectively establishes an instructional architecture that is both highly conventional and heavily resource-dependent on physical materials and the human instructor, solidifying a unique, non-digital adaptation to the blended learning paradigm.

3. Student Motivational Dynamics Under Unplugged Constraints

A major finding was the strong correlation between the mandatory device restriction and the emergence of positive motivational externalities, particularly concerning the regulation of attention and cognitive load (Chang et al., 2022). Interview transcripts consistently illustrated that the structural elimination of common digital distractions inherent to the device ban led to a measurable increase in students' capacity for sustained cognitive focus. Students reported feeling obligated to engage in more deep reading of print sources, a cognitive activity often displaced by digital skimming. A participant articulated this effect: "The sheer lack of smartphones forces you to actually sit and digest the textbook, not just look up quick facts online. I've found my focus on the dense, complex material is much more sustainable now" (Student A, 2025; Tjahjadi et al., 2023). This suggests the structural discipline successfully mediated the negative attentional fragmentation often associated with ubiquitous personal devices.

The findings are supported by empirical interview data. For instance, one student stated, "Without smartphones, I feel more focused on reading textbooks and understanding the material deeply" (Student 1, Interview, 2025). Another student expressed, "We are expected to be independent learners, but we cannot freely access information, which limits our exploration" (Student 3, Interview, 2025). These responses indicate a dual effect of device restriction on student motivation, supporting previous findings on the relationship between autonomy and motivation (Ryan & Deci, 2020).

Despite the noted improvements in attention, a profound motivational contradiction emerged regarding informational access. While students were motivated by the predictable structure, they reported significant frustration and feelings of demotivation rooted in their absolute inability to conduct spontaneous, self-directed exploratory research (Ryan & Deci, 2020). The institutional restriction of IT access made independent, curiosity-driven exploration functionally impossible, fostering an acute, unwelcome dependency on teacher-curated resources. This tension was explicitly voiced: "The Merdeka Curriculum tells us to take ownership and explore, but when we have a spontaneous research question, we can't just use a device. We are forced to wait, or rely only on what the teacher hands out, and that feels intellectually limiting" (Student B, 2025). This conflict starkly undermines the fundamental principle of student autonomy the freedom to choose resources and pathways which is a core educational goal of the national curriculum (Maufiroh et al., 2025).

A further significant outcome was the compensatory flourishing of essential analog soft skills, spurred by the minimal digital engagement. The necessity for students to physically negotiate the use of limited shared resources and to rely entirely on face-to-face collaboration for information-gathering tasks (activities usually mediated digitally) substantially reinforced their skills in interpersonal communication, collaborative negotiation, and foundational teamwork competencies. These enhanced analog skills functioned as essential non-digital coping mechanisms and adaptive social tools necessary for successful academic navigation within the constrained learning environment.

Based on the findings, this study proposes a conceptual framework illustrating the relationship between ICT limitation, pedagogical adaptation, and student motivation. ICT constraints lead to the implementation of unplugged pedagogy, which produces two contrasting effects: (1) increased cognitive focus and competence, and (2) reduced autonomy in learning. These dual effects create a pedagogical paradox in achieving the goals of the Merdeka Curriculum. This framework provides a basis for understanding learning dynamics in resource-constrained environments (Ryan & Deci, 2020; Rasheed et al., 2020).

DISCUSSION

The instructional methodology identified in this case represents a potent example of Pedagogical Resilience (Syarifuddin & Saparuddin, 2021). The faculty did not merely tolerate infrastructural constraints; they strategically adapted their pedagogy by transforming a military-style security restriction (the device ban) into a primary component of their instructional structure. This sophisticated adaptive maneuver allowed for the maintenance of curricular continuity despite severe disadvantages.

Crucially, this adaptation results in a model that is profoundly asymmetrical (Hadi & Anwar, 2025). The blend is fundamentally confined to high-quality human interaction and mandated physical self-study. Its functionality reaches a hard ceiling imposed by the single-unit IT capacity, preventing evolution toward true, balanced digital-physical integration. The success of this resilience lies in its capacity for structural discipline, which offsets the lack of technological dynamism. This finding is reinforced by other studies across the Indonesian archipelago that highlight the necessity of high human capital such as teacher innovation and deep face-to-face instruction to overcome severe resource deficits in rural and boarding school settings (Husen et al.,

2025; Syarifuddin & Saparuddin, 2021). The core challenge is sustaining educational quality based on highly localized human effort, rather than reliable infrastructure.

The motivational findings present a highly nuanced application of Self-Determination Theory (SDT) (Ryan & Deci, 2020), demonstrating a complex state of conflicted needs fulfillment. The consistently high frequency of direct teacher-student and peer-to-peer interaction, coupled with structured, distraction-free engagement with academic texts, robustly satisfied two of the three universal psychological needs. Relatedness (social connection) flourished through mandatory physical collaboration, compensating for absent digital social channels. Competence (mastery over content) was enhanced by the enforced deep cognitive focus, leading students to feel more academically effective (Tjahjadi et al., 2023).

Conversely, the institutional device prohibition systematically and severely compromised the third fundamental need: autonomy. By eliminating student control over resource selection and independent information access, the policy actively blocked the intrinsic motivational drive toward self-direction (Ryan & Deci, 2020). The resulting motivation is characterized by structural reinforcement (boosting competence) simultaneously causing informational blockade (crippling autonomy). This finding carries significant theoretical weight, suggesting that educational policies focused solely on discipline and structure may achieve short-term competence gains but incur long-term motivational costs by inhibiting the development of independent, self-regulating learners, which is a critical goal for post-secondary success.

When this context is compared with the prevalent literature on technology-rich blended learning models (Graham et al., 2022; Hrastinski, 2019), the motivational gains observed specifically the enhanced cognitive focus are demonstrably non-technological in origin. The educational efficacy arises from the structural elimination of pervasive digital distractors (Kurniawati, 2020), rather than any innovative use of the minimal IT.

This investigation argues that, in contexts of severe scarcity, the motivational power of structure and discipline (the device ban) overrode the negligible impact of the limited technology. This stands in sharp contrast to the default policy assumption that technology is the primary driver of modern educational quality. The key implication, supported by regional findings on learning effectiveness in non-IT settings, is that a highly structured, well-enforced unplugged educational approach can generate motivational and cognitive outcomes—particularly deep concentration—that are equal to, or potentially superior to, the outcomes of poorly managed or under-resourced digital integration efforts. The central lesson is that effective pedagogy, even in its most conventional form, requires the elimination of interference, a task that was here achieved through prohibition rather than through effective technological management.

The findings present a critical imperative for policy makers to resolve the fundamental contradiction between the school's non-negotiable security/military directives (the strict device ban) and the progressive, student-centric philosophy of the Merdeka Curriculum (Rahmawatie et al., 2025). The national curriculum explicitly requires student-led inquiry and exploratory learning, objectives that are systematically thwarted by the institutional denial of informational autonomy. The policy is creating an environment where security mandates directly undermine educational philosophy.

Policy evolution must therefore move beyond mere prohibition to one of structured enablement. Decision-makers must urgently prioritize the allocation and systematic scheduling of

ring-fenced, dedicated ICT time and specialized facilities. This means establishing mandatory, supervised computer laboratory sessions designed for active research and exploration, moving beyond the passive presentation function of a single projector/TV. This strategic intervention would serve to reconcile the institutional demand for security (by controlling access time and location) with the educational necessity of exploration. It would allow students a dedicated, safe channel through which to satisfy their psychological need for autonomy and successfully meet the curricular mandate for independent, information-driven learning, thereby transforming the current structural conflict into a functional, two-stage learning process.

CONCLUSIONS

This research definitively establishes that the conventionalized blended learning framework, manifested as an intensive unplugged pedagogy in a resource-scarce, highly disciplined setting, represents a valid and viable adaptive teaching strategy (Hadi & Anwar, 2025; Syarifuddin & Saparuddin, 2021). Strong empirical support confirms the model's efficacy in fostering key components of intrinsic motivation. Specifically, the compulsory structural discipline and the subsequent elimination of digital interference were shown to significantly improve cognitive focus and effectively meet students' core psychological requirements for competence (mastery) and relatedness (social integration) (Ryan & Deci, 2020).

However, the mandatory and extreme nature of these institutional restrictions simultaneously creates a fundamental pedagogical paradox. While the enforced structure succeeds in enhancing competence, the systematic denial of informational access leads to a profound curricular contradiction and severely impairs student autonomy. This inhibition of self-directed, open-ended exploration poses a substantial long-term obstacle to developing the sustained motivational growth essential for continuous learning, thereby directly undermining the philosophical goals of the national curriculum (Maufiroh et al., 2025). The model's primary asset its resilience and focused environment is inherently tethered to its chief liability the suppression of informational independence.

The adaptive model detailed here provides a highly pertinent implementation template for educational providers navigating challenging circumstances, particularly those located in Indonesia's 3T (Terdepan, Terluar, Tertinggal) regions, where significant infrastructural deficiencies are commonplace (Rasheed et al., 2020). The study validates the strategic necessity of prioritizing robust human interaction and meticulously structured analog study when dependable technology is unavailable.

Moving forward, scholarly endeavors must transition from mere documentation of this adaptation toward the active design of harmonization strategies. Subsequent research should focus on identifying practical, scalable interventions capable of seamlessly merging the advantageous outcomes of structural discipline (the focused, unplugged setting) with the critical necessity for digital information access demanded by contemporary curricula. This necessitates the creation of controlled, supervised access protocols and the appropriate allocation of dedicated Information and Communication Technology (ICT) facilities to ensure that students can satisfy their fundamental need for autonomy without compromising the security and focused learning environment established by the current unplugged framework.

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