Managing Facilitator and Learning in Remote Area Community Learning Centers: A Case Study of Non-Formal Education in Barito Timur, Central Kalimantan

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Abstract

This study explores the adaptive learning management model implemented in remote non-formal education institutions in Central Kalimantan, Indonesia, focusing on CLC Sejahtera Insan Indonesia and CLC Rurang Bulau Jaya. Both institutions operate under challenging geographical and infrastructural conditions but demonstrate effective management and facilitation strategies. Using a qualitative multiple case study design, data were collected through in-depth interviews, participant observation, and document analysis involving institutional heads, facilitators, learners, and local education officials. The findings reveal that facilitators play multi-dimensional roles as educators, managers, and social innovators who sustain educational processes through creativity and self-directed learning. CLC Sejahtera Insan Indonesia emphasizes community-based flexibility and contextualized learning, while CLC Rurang Bulau Jaya employs structured participatory management supported by institutional networks. From these cases, an adaptive learning management model was conceptualized, integrating three interrelated components: adaptive leadership, autonomous and collaborative facilitators, and a contextual learning environment. The model operates through four cyclical phases consisting of participatory planning, flexible implementation, reflective evaluation, and continuous innovation, supported by the core values of collaboration, innovation, and contextuality. The study concludes that the success of non-formal education in remote areas is not primarily determined by physical resources but by the adaptive capacity of human actors to integrate reflection, flexibility, and social engagement into management practices. This model provides a conceptual framework for developing resilient and community-responsive learning systems in resource-limited environments.

Keywords: Community Learning Centers, Managing Facilitator, Non-Formal Education, Remote Area.

Introduction

Community Learning Centers (CLCs), known in Indonesia as Pusat Kegiatan Belajar Masyarakat (PKBM), are non-formal education units established to expand lifelong learning opportunities through literacy, life skills, vocational, and community empowerment programs. Operating outside formal school structures, CLCs are positioned as critical instruments of social development and community cohesion (1). In geographically remote or dispersed settings, where learning may occur in household-based spaces, mobile communities, or post-crisis areas, CLCs often adopt distance, blended, or home-based learning modalities. Such arrangements demand contextual adaptation in pedagogy, management, and technology to ensure continuity of educational services despite infrastructural and logistical barriers (2). These adaptive requirements highlight the managerial responsibilities of sustaining facilitator capacity, aligning curricula with local needs, and coordinating ICT-mediated instruction when face-to-face contact is limited (3).

Effective CLC management therefore requires a synthesis of leadership, supervision, administrative capacity-building, and mentoring to maintain tutor performance, program relevance, and institutional continuity. Empirical studies confirm that leadership and supervision practices directly influence tutor performance and program outcomes (4, 5). Organizational mapping and descriptive management analyses emphasize the importance of clear structures, such as defined statutes, role distribution, and routine mentoring as foundational to institutional quality (6). Within decentralized educational governance, consistent support from local governments, through financial grants and operational subsidies play a decisive

role in sustaining and scaling CLC services (7). Moreover, the introduction of internal quality assurance mechanisms tailored to non-formal contexts is increasingly recognized as vital to producing evidence-based institutional decisions and aligning CLC work with Sustainable Development Goals for inclusive lifelong learning (8).

Facilitators in remote area CLCs perform multiple and intersecting roles, as instructors, managers, mentors, and community mobilizers requiring a hybrid set of pedagogical and organizational competencies. Leadership and supervisory frameworks stress regular coaching, structured feedback, and ongoing performance monitoring to enhance instructional quality (9). Under conditions where remote and asynchronous modes dominate, professional communication becomes central to sustaining pedagogical coherence and sharing instructional innovations (10). Facilitators benefit from explicit training in digital pedagogy, communication strategies, and the use of low-bandwidth tools like a messaging application, video conferencing, and learning management systems to maintain presence and continuity (11). Pedagogical orientations within CLCs increasingly reflect learner-centered, experiential, and self-determined approaches aligned with adult learning principles and local realities. Heutagogy, or self-determined learning, has emerged as a promising framework for non-formal education, promoting learner autonomy and lifelong adaptability. It can be operationalized through participatory action research and co-designed curricula responsive to community priorities (12). Project-based and experiential designs bridge vocational and general competencies, fostering relevant, transferable skills applicable to work and civic life (13). In multilingual or refugee contexts, differentiated, learner-centered, and community-oriented interventions (often experiential or work-based) have been shown to promote meaningful engagement and identity-related learning outcomes (14). Equity-driven CLC programs emphasize flexibility and inclusivity, offering adaptable curricula, distance options for adults, and differentiated support for marginalized groups (15).

The design of remote or online curricula for non-formal settings benefits from systematic stakeholder involvement. Design-based research demonstrates that parent–community collaboration enhances contextualization and learner engagement (16). Community institutions (NGOs, religious organizations, and local non-profits) often act as partners or venues for blended delivery, strengthening legitimacy and mobilizing local resources for family and adult learning (17). Aligning non-formal initiatives with regional or national programs, such as Indonesia's Merdeka Belajar policy, creates reciprocal reinforcement between sectors and opens new pathways for learners (18).

Technology adoption is pivotal for enabling remote CLC provision. Studies report that common digital tools such as messaging apps, Zoom, Microsoft Teams, Google Classroom, Moodle serve as pragmatic enablers in settings with uneven infrastructure (19). Rapid Application Development and customized learning apps have also been piloted to enhance access to materials and interaction between tutors and learners.

The rise of artificial intelligence and predictive-personalized models promises to further transform non-formal education by delivering personalized learning support (20). Yet, these innovations demand deliberate investments in facilitators' digital competencies and professional communication skills (21). Pedagogical technology innovations such as podcasts and AI-based media have been introduced to enhance learner motivation, accessibility, and creativity (22). Blended learning models combining limited face-to-face engagement with asynchronous online activities are particularly well-suited for adult and community learners, enabling independent learning trajectories while maximizing scarce in-person time for project work and social mobilization (23).

Sustaining remote CLCs requires attention to both financial and social viability. Entrepreneurship-oriented programs and institutional digital marketing initiatives have been proposed as mechanisms to strengthen visibility, generate income, and consolidate community participation. Mentorship models focused on organizational formation for clarifying governance structures and administrative routines have proven effective in the early establishment and long-term sustainability of CLC's. Local government investments and predictable operational assistance remain decisive levers for maintaining

non-formal education centers in rural municipalities.

Quality assurance, monitoring, and policy alignment form the backbone of institutional accountability. Formalized Internal Quality Assurance (IQA) instruments help CLC managers make informed decisions and align with broader SDG-related frameworks (24). Complementary policy structures at the village and municipal levels reinforce the institutionalization of non-formal education, while continuous evaluation ensures program continuity and measurable impact (25). Regions with stable funding and coherent policy ecosystems demonstrate stronger CLC performance and reach (26).

Despite these frameworks, CLCs in resource-constrained and geographically isolated areas continue to face acute challenges. Studies on non-formal and refugee education underline persistent shortages of financial, human, and infrastructural resources, constraining access to continuing education and shaping managerial priorities. Common issues include limited community awareness, inconsistent tutor motivation, and technological divides that risk deepening exclusion unless mitigated through context-sensitive strategies and partnerships. When household-based learning becomes the default mode, the pedagogical locus shifts and requires targeted supports for both facilitators and learners to adapt instruction to domestic realities.

These challenges are vividly reflected in the case of Central Kalimantan's Barito Timur Regency, where settlements are dispersed across oil palm estates and access to educational infrastructure remains limited. Within this region, two community learning centers, namely is CLCs Sejahtera Insan Indonesia (SII) in Pematang Karau District and CLCs Rurang Bulau Jaya (RBJ) in Dusun Timur District operate under similarly constrained conditions yet have achieved notable distinctions. CLCs SII has been recognized by the Provincial Education Office for its effective institutional management and consistently high enrollment, while CLC Rurang Bulau Jaya remains the only accredited "B" (excellent) CLC in the regency. The contrasting profiles of these two institutions present an opportunity to examine how facilitators and managers employ adaptive strategies to maintain learning quality, community trust, and institutional sustainability in remote contexts.

Synthesizing the reviewed literature suggests a coherent set of managerial and pedagogical principles for excellence in remote CLCs. Leadership must be distributed and supported by routine supervisory mentoring and well-defined organizational roles (27). Curricula should remain learner-centered and flexible, emphasizing heutagogical, project-based, and experiential approaches aligned with local identity and livelihood contexts (28). Digital adoption should be pragmatic and context-sensitive, leveraging low-bandwidth tools while investing in facilitator digital literacy (29, 30). Strong community partnerships and entrepreneurship-driven sustainability strategies can expand legitimacy and resource mobilization (31). Above all, internal quality assurance and alignment with local and national policy frameworks are essential for coherence, accountability, and long-term viability (32).

Yet, significant knowledge gaps remain. Comparative studies across different remote contexts are scarce, and empirical evidence linking managerial practices to measurable learning outcomes in non-formal settings remains underdeveloped (33). Moreover, the long-term effects of heutagogical and blended pedagogies in marginalized or geographically isolated communities are still poorly understood. These gaps justify deeper investigation into the lived experiences of facilitators who manage learning under systemic constraints, particularly in contexts like Barito Timur, where geographical isolation and institutional innovation intersect.

Despite the growing body of literature on community learning centers and remote non-formal education, existing studies tend to focus on organizational mapping, program implementation, or tutor performance, leaving a significant gap in understanding how learning is managed under extreme geographical isolation and resource scarcity. Prior research rarely explains the daily managerial decisions facilitators must make or how these decisions interact with contextual constraints. Comparative evidence between different types of remote CLCs is also limited. Therefore, the core issue addressed in this study is the lack of empirically grounded explanations of how facilitators adapt, negotiate constraints, and integrate leadership, pedagogy, and community engagement in remote contexts. This study fills the

gap through a comparative analysis of two contrasting CLCs in Central Kalimantan.

Therefore, this study aims to examine in depth how facilitators manage learning and institutional processes in remote CLCs in Barito Timur Regency, Central Kalimantan. By conducting comparative qualitative case studies of CLC SII and CLC RBJ, this research seeks to uncover the managerial strategies and adaptive practices employed by facilitators, the contextual factors influencing their effectiveness; and Adaptive Learning Management Model in Remote Non-Formal Institutions.

This research is important because it contributes to the current development of community-based education by positioning CLC management at the intersection of leadership, pedagogy, and technology in remote areas, an area that has been underexplored in both Indonesian and global studies. Furthermore, this research provides empirical insights that advance theoretical understanding of adaptive and lifelong learning in non-formal education, while also offering practical insights for policymakers and practitioners seeking to strengthen education management in geographically protected areas. By articulating how facilitators sustain learning amidst systemic constraints, this research reinforces the global narrative that community learning centers, when managed effectively, can serve as powerful engines for inclusion, empowerment, and sustainable local development.

Methodology

This study employed a qualitative approach with a multiple case study design. The approach was selected to obtain an in-depth and contextual understanding of how facilitators manage learning processes and institutional operations under conditions of limited resources in remote areas. An interpretive qualitative paradigm was adopted because it focuses on the subjective meanings constructed by actors within non-formal education through their lived experiences and social interactions (34). Accordingly, this research not only describes empirical facts but also seeks to interpret the social dynamics and adaptive strategies that emerge in learning management practices within community learning centers (Pusat Kegiatan Belajar Masyarakat or CLC). This design enables the identification of effective management strategies as well as contextual

factors influencing success or constraints in learning implementation. Each CLC was treated as a bounded case, while cross-case analysis was conducted to identify both convergences and divergences in management practices between the two institutions.

The research was conducted in two CLCs located in Barito Timur Regency, Central Kalimantan, namely CLC SII in Pematang Karau District and CLC RBJ in Dusun Timur District. Both institutions operate in relatively isolated rural settings surrounded by oil palm plantations, where settlements are scattered, and transportation and internet access are limited. Despite sharing these constraints, CLC SII is recognized as the institution with the highest learner enrollment and has received awards from the Provincial Education Office of Central Kalimantan for effective institutional management. Meanwhile, CLC RBJ stands out as the only CLC in the regency accredited at grade "B," reflecting its success in maintaining educational quality amid resource limitations.

The two CLCs were purposefully selected as contrasting yet information-rich cases. CLC SII represents an extreme remote setting marked by infrastructural scarcity and high dependence on facilitator improvisation, while CLC RBJ represents a more accessible rural setting with stronger institutional support. This contrast enables the study to capture a broader spectrum of adaptive managerial practices and strengthens the analytical depth of cross-case interpretations.

Participants in this study were selected through purposive sampling, based on their direct involvement in management and learning activities within the two CLCs. The informants comprised the heads of CLC SII and CLC RBJ, facilitators or tutors of equivalency and skills training programs, active learners participating in CLC programs, local community representatives engaged in empowerment activities, and officials from the Barito Timur Education Office responsible for overseeing non-formal education institutions. The total number of participants was determined using the principle of data saturation, whereby data collection ceased once no new or relevant information emerged from the field.

Data were collected through in-depth interviews, participant observation, and document analysis. Semi-structured interviews were conducted using an interview guide designed to explore facilitators'

experiences, strategies, and reflections in managing learning processes and overcoming resource constraints. The interviews were carried out directly at the CLC sites, audio-recorded with participants' consent, and transcribed verbatim for analysis. Participant observation was conducted to understand real-life conditions in each CLC, including interactions between facilitators and learners, the organization of learning sessions, and managerial practices. Document analysis covered institutional records such as lesson plans, activity reports, accreditation files, financial reports, and online publications, all of which were used to strengthen data triangulation.

The collected data were analyzed through an interactive and iterative process, encompassing data condensation, data display, pattern matching, and conclusion drawing with verification (35). The analysis proceeded inductively, identifying themes emerging from field data and comparing them across cases to detect similarities and differences in management strategies between the two CLCs. Data trustworthiness was ensured through the application of four criteria, thas is credibility, transferability, dependability, and confirmability by conducting source and method triangulation, member checking with key informants, developing thick contextual descriptions, and maintaining critical researcher reflexivity throughout the analytical process (36). Triangulation was applied by integrating interview data, participant observations, and document analysis to validate emerging themes. Interviews captured subjective experiences, observations provided real-time behavioral evidence, and institutional documents verified reported practices. Cross-checking these data sources reduced interpretive bias, while discrepancies were clarified through follow-up communication with participants. This triangulated approach enhanced the credibility and confirmability of the study's findings.

Prior experience in non-formal and community-based education was acknowledged as a potential source of assumptions regarding the operational challenges faced by Community Learning Centers (CLCs) in remote areas. To minimize potential bias, reflexive notes were maintained throughout the research process, interactions with participants were systematically documented, and continuous reflection was conducted to examine how the researcher's background might influence data interpretation. Member checking, triangulation, and conversational interviewing techniques were applied to ensure that the findings reflected participants' perspectives rather than preconceived assumptions.

Results and Discussion
The Managerial Strategies and Adaptive Practices Employed by Facilitators

Facilitators in both community learning centers demonstrated strong managerial and adaptive capacities in maintaining educational processes under limited infrastructural and geographical conditions. Based on interviews, the facilitators implemented diverse strategies aligned with the institutional characteristics and community context of each CLC. At CLC SII, adaptive strategies primarily emerged from the facilitators' personal initiatives to sustain learning activities in areas distant from the city center and with minimal supporting facilities. Bunga (F-SII) explained:

"We are far from the city here,sometimes the signal disappears, and learning materials are scarce. So, we adjust to the situation. Sometimes classes are held in villagers' houses, at the community hall, or even in the plantation if participants cannot come to the center" (F-SII-20/3/2025).

Similarly, Erwin (F-SII) shared:

"If we wait for formal training from the education office, nothing will happen. So, we study on our own using the internet, join free online courses, watch YouTube lessons, read materials, and experiment with teaching methods that suit the plantation workers" (F-SII-20/3/2025).

The findings indicate that facilitators at CLC SII developed self-initiated and context-based managerial strategies. They continuously upgraded their competencies through online self-learning, digital peer networks, and informal educator communities. In the absence of formal training, these facilitators relied on self-directed professional development as the foundation of their instructional management. Moreover, they utilized available public spaces such as community halls, prayer rooms, and villagers' houses as flexible learning venues. Their persistence reflects a form of situational leadership that blends creativity, flexibility, and social commitment, ensuring institutional sustainability amid

adversity. The following is a Figure 1 of documentation from CLC SII.

In contrast, CLC Rurang Bulau Jaya (RBJ) operates in a more accessible environment, located only six kilometers from the regency capital. This proximity to the Education Office facilitates smoother access to administrative support and collaboration. However, accessibility alone does not explain the center's effectiveness; it is the facilitators' structured management culture and adaptive innovation that distinguish RBJ's success. Dayang (F-RBJ) noted:

"We hold weekly meetings to evaluate programs, but the key is adjusting our training to what people actually need. For example, many women here want to learn how to make products from palm sugar since sugar palm trees are abundant around the village" (F-RBJ-25/3/2025).

Meanwhile, Bazan (F-RBJ) added:

"We also use a blended system. Some materials are shared through WhatsApp so learners who work can still participate. During the rainy season or harvest time, we replace meetings with independent assignments" (F-RBJ-25/3/2025).

Figure 1: Facilitators Provide Teaching to Students at CLC SII

These accounts illustrate that RBJ facilitators apply collaborative and systematic management strategies supported by institutional routines. They engage in regular coordination meetings, peer mentoring, and internal supervision, practices aligned with internal quality assurance principles (37, 38). The learning programs are contextualized to community livelihoods, emphasizing vocational training and entrepreneurship such as palm-sugar processing and organic fertilizer production. In this way, facilitators link educational content with local economic opportunities, reinforcing the role of CLC as a community empowerment hub.

Digital tools are also integrated into daily management and pedagogy. The facilitators utilize WhatsApp groups and Google Workspace for material distribution, attendance monitoring, and communication with learners who cannot attend face-to-face sessions. This pragmatic implementation of blended learning enhances accessibility and flexibility for adult learners an approach well-suited to rural non-formal education (39).

A comparative analysis of both sites reveals distinct but complementary patterns of adaptive management. At CLC SII, adaptation manifests as grassroots improvisation driven by personal initiative, where facilitators act simultaneously as teachers, managers, and social mobilizers. Their actions exemplify micro-level adaptation such as informal, experiential, and deeply embedded in community realities. Conversely, CLC RBJ embodies a more institutionalized adaptation, characterized by formal planning, structured supervision, and active networking with external

partners. While SII relies on creativity and personal resilience, RBJ benefits from procedural stability and collaborative culture.

Despite these contrasts, both institutions demonstrate a shared foundation: facilitator-driven innovation. In both sites, facilitators are the main catalysts of organizational continuity, compensating for resource scarcity through motivation, professional autonomy, and reflective practice. Their dual roles as educators and institutional managers highlight that adaptive management in community learning centers is fundamentally human-centered, dependent on the facilitators' ability to transform limitations into opportunities.

From the synthesis of both cases, three core dimensions of managerial and adaptive practice emerge. First, professional self-reliance, as facilitators engage in continuous self-learning through online platforms and peer networks to enhance pedagogical and digital competencies. Second, curricular contextualization, in which learning materials are redesigned to reflect learners' real-life contexts such as integrating plantation work, household production, and local entrepreneurship into learning modules. Third, collaborative leadership, manifested through flexible communication, distributed responsibilities, and peer mentoring that sustain institutional functionality despite infrastructural gaps.

These dimensions collectively portray facilitators not merely as instructors but as community-based innovators and learning managers. Agency as the human capacity to maintain institutional viability through creativity, reflection, and collaboration. In this sense, the resilience of CLC SII and RBJ reinforces broader evidence that the success of remote community learning centers depends less on material infrastructure and more on human capability, initiative, and social trust (40).

The findings demonstrate that effective managerial and adaptive strategies in remote non-formal education rely on facilitators capacity to innovate, self-learn, and contextualize instruction. At CLC SII, individual creativity and self-directed learning drive institutional continuity amid isolation and limited resources. At CLC RBJ, structured collaboration and institutionalized management ensure stability and quality through responsive, community-based programs. Together, these models illustrate that sustainable CLC management in remote areas requires a dynamic balance between individual initiative and institutional support, forming the dual pillars of adaptive learning management in Indonesia's non-formal education landscape.

The Contextual Factors Influencing their Effectiveness

The effectiveness of managerial strategies and adaptive practices implemented by facilitators in both CLCs is not determined solely by their individual capabilities but also by the broader social, cultural, and institutional contexts in which they operate. Interviews with institutional heads and learners from both centers revealed that facilitator performance is shaped by the learning environment, learner motivation, social relationships, and the organizational culture cultivated within each CLC. These contextual factors function as enabling conditions that either strengthen or constrain the facilitators' capacity to sustain meaningful educational practices.

The head of CLC SII emphasized that facilitator effectiveness is clearly reflected in the improved learning outcomes, learner discipline, and completion rates over the past two years. He attributed this success not to material infrastructure, but to the facilitators' ability to foster close social relationships with their learners.

"Our facilitators are not only teachers; they are like family members to the learners. They visit participants' homes, listen to their personal struggles, and even help them find solutions outside the classroom. Many learners work in oil palm plantations and are tired after work, but because the facilitators care about them and understand their realities, they feel valued and keep coming to study, even if it means walking long distances" (Head-SII-20/3/2025).

Similarly, the head of CLC (RBJ) explained that the effectiveness of facilitators in his institution is evident not only in attendance and completion rates but also in behavioral change, self-directed learning, and peer collaboration among participants.

"We have seen real transformation. Learners are not just attending classes; they are taking initiative. Some finish their modules ahead of schedule and even volunteer to tutor others. This shows that facilitators are not simply transferring knowledge they are motivating learners, building confidence, and nurturing independence. It is the result of

consistent mentoring, patient communication, and a positive learning atmosphere created by the facilitators" (Head-RBJ-25/03/2025).

The perspectives of learners themselves reinforced these observations. A participant from CLC SII, (WB-SII-1), shared her personal experience:

"At first, I didn't feel motivated to study because I was always exhausted from working on the plantation. But Ms. Bunga kept encouraging me. She visited my home, brought simple exercises, and told me that education could help me manage money better and support my children's future. Her persistence made me realize that learning is worth the effort, even when it's difficult" (WB-SII-1-20/03/2025).

Another learner, (WB-SII-2), echoed this sentiment, emphasizing the relevance of learning materials to daily life:

"The way the facilitators teach is different from school. The lessons are practical—like learning to count wages or record harvest results. They use real examples from our lives. It makes me feel that studying is not just for passing exams but for improving what I do every day" (WB-SII-2-20/03/2025).

Learners from CLC Rurang Bulau Jaya also highlighted the facilitators' role in creating a motivating and empowering environment (WB-RBJ-1) explained:

"Here, we are guided not only through theory but through real practice. The facilitators show us how to make palm-sugar products or organic compost, step by step, and then help us sell them at the local market. I never thought education could be this practical—it gives me confidence and skills I can use immediately" (WB-RBJ-1-25/03/2025).

Meanwhile, (WB-RBJ-2) described the facilitators' discipline and communication as key to sustaining participation:

"Every week, there is a clear schedule. We discuss progress face-to-face and also through WhatsApp. The facilitators send reminders, check our assignments, and motivate us when we are late. They never scold us; instead, they guide and encourage us to keep trying. This makes us feel respected and responsible" (WB-RBJ-2-25/03/2025).

These testimonies reveal that facilitator effectiveness is strongly shaped by several contextual factors. First, social proximity and emotional bonds between facilitators and learners serve as a driving force for sustained participation. Second, the relevance and practicality of learning content to the learners' everyday realities such as plantation work, small-scale business, and family life make education meaningful and applicable. Third, organizational support and collaborative culture within the CLC strengthen facilitators' ability to innovate and maintain continuity despite material limitations.

In CLC SII, effectiveness is largely supported by community-based relationships and the facilitators' empathic approach. Their familiarity with learners' social and economic conditions allows them to adjust teaching schedules and methods according to participants' working hours and household responsibilities. The institution's remote setting also cultivates a spirit of solidarity, where facilitators act as both educators and community advocates. The head's encouragement and moral support further reinforce their motivation to sustain activities even with minimal facilities.

In contrast, at CLC RBJ, contextual effectiveness is enhanced by a stable management system and external partnerships. Its proximity to the regency capital facilitates collaboration with the Education Office, local NGOs, and community groups. These partnerships provide access to resources such as digital learning materials, financial assistance, and administrative support. The diversity of learners, ranging from young adults to older participants also encourages the use of flexible blended-learning approaches, combining face-to-face instruction with online communication and assignments, particularly during adverse weather or harvest seasons.

A comparative view reveals two distinct but complementary patterns: at SII, facilitator effectiveness is rooted in human connection and social trust, while at RBJ, it is driven by institutional structure and resource accessibility. In the former, human relationships compensate for infrastructural scarcity; in the latter, structured management amplifies the facilitators' efficiency. Together, these findings confirm that non-formal education success in remote areas depends not only on pedagogical expertise but also on the synergy between social, institutional, and environmental contexts that enable learning to thrive.

The findings align with the principles of context-responsive educational management (41, 42), which argue that institutional effectiveness arises from the dynamic interaction among human actors, social environments, and systemic support. Facilitators operate within an ecosystem of relationships and resources that shape their capacity to adapt. Thus, effective adaptive strategies cannot exist in isolation, they are sustained by a context that is socially cohesive, institutionally supportive, and responsive to learners lived realities.

The effectiveness of managerial and adaptive strategies among facilitators in both CLCs is strongly influenced by contextual dynamics. At CLC SII, personal relationships, empathy, and community closeness underpin success, whereas at CLC RBJ, structured institutional systems and external networks enhance performance. Collectively, these contexts reveal that social environment, organizational culture, and institutional support act as the key catalysts that enable facilitators to implement effective management and adaptive learning practices in remote community education settings.

Adaptive Learning Management Model in Remote Non-Formal Institutions

Findings synthesized from both cases indicate that non-formal education institutions in remote areas have developed an adaptive learning management model that is flexible, participatory, and contextually grounded. This model emphasizes not only the instructional process but also the managerial system that enables facilitators and administrators to innovate amid limited resources. Based on interviews with the heads of CLC SII and CLC RBJ, as well as four facilitators from both institutions, a systemic understanding emerged of how adaptive management processes occur across planning, implementation, and evaluation phases.

The head of CLC SII explained that the management model within his institution prioritizes flexibility and adaptation to the realities of the community.

"We cannot replicate the formal school system here. People work on plantations, their schedules are unpredictable, and distances between villages are long. Therefore, we designed a learning system that adjusts to the learners' time. Facilitators have the freedom to arrange schedules, choose learning venues, and even adapt the materials to participants' needs. What matters most is that learning continues and produces tangible results" (Head-SII-20/3/2025).

Similarly, Erwin (F-SII) described that adaptation within the institution is achieved through a blend of simple managerial approaches and strong social relationships.

"We manage our own schedules and lesson plans but always coordinate with the head of the institution. There's no rigid structure. For instance, when learners are busy with the harvest, we adjust the timetable. If we lack materials, we search online or create our own based on real-life examples from their work" (Erwin, F-SII-20/3/2025).

The emerging model at CLC SII illustrates a pattern of community-based flexible management. Facilitators are granted considerable autonomy in managing learning activities, while the institutional leader acts as a guide ensuring alignment with institutional goals. Decision-making processes are dialogic rather than hierarchical, allowing adaptive responses based on shared experiences in the field. This structure nurtures a learning culture rooted in trust, cooperation, and collective reflection a form of distributed leadership that fosters sustainability despite limited physical and financial resources.

Meanwhile, CLC Rurang Bulau Jaya (RBJ) demonstrates a more systematic and structured form of adaptive management, though it remains flexible in practice. The head of RBJ described:

"We maintain a clear structure and schedule, but it's not rigid. There are weekly meetings and program reports, but facilitators can adjust methods or class times when learners' conditions require it. We also involve the community and village government in each program to ensure local support and shared responsibility" (Head-RBJ-25/03/2025).

Dayang (F-RBJ) emphasized that institutional support plays a vital role in maintaining program continuity:

"We plan our programs collectively. The head of CLC gives us room to express ideas but also ensures that we stay aligned with institutional targets. We use a blended learning model—partly online and partly face-to-face—so learning continues even when conditions change. The structure helps us coordinate, but the implementation always follows the learners' realities" (Dayang, F-RBJ-25/3/2025).

The model observed at RBJ reflects participatory structured management, which combines formal managerial systems with operational flexibility at the facilitator level. The organizational structure functions not as a control mechanism but as a coordination framework to ensure consistency and accountability. Adaptation occurs through regular evaluations, internal mentoring sessions, and the use of simple digital tools such as WhatsApp groups for communication, planning, and reporting. This structured yet adaptive design allows the institution to balance order with creativity, ensuring both stability and responsiveness in non-formal education delivery.

To strengthen the analytical rigor of this study, a cross-case synthesis was conducted to identify convergences and divergences between the two institutions. The comparison highlighted three shared dimensions such as professional self-reliance, curricular contextualization, and collaborative leadership while also exposing institution-specific differences shaped by governance structures, geographic accessibility, and community characteristics. This cross-case perspective enhances the explanatory power of the findings by showing how adaptive management develops differently across contexts.

Synthesizing insights from both cases, an overarching conceptual model of adaptive learning management in remote non-formal institutions emerges. The model comprises three interdependent components: Adaptive Leader-

ship, in which the institutional head acts as a flexible leader who fosters innovation and maintains open horizontal communication; Autonomous and Collaborative Facilitators, who exercise independence in designing and implementing learning processes while collaborating with peers, administrators, and the local community; and a Contextual Learning Environment, where learning processes are aligned with the community's social, economic, and geographical realities. Time, place, and learning media are designed to be flexible, and technology is employed pragmatically to sustain learning continuity.

Together, these components form a dynamic adaptive management cycle consisting of four main phases, that is Participatory Planning, in which facilitators and administrators jointly determine learning schedules, curriculum focus, and community learning needs; Flexible Implementation, where teaching methods and timing are adjusted according to learners' daily routines and environmental conditions; Reflective Evaluation, conducted collaboratively through informal discussions, weekly meetings, and direct feedback from learners; and Continuous Revision and Innovation, where evaluation results inform ongoing program improvements and innovations for future cycles. This cyclical process is illustrated in Figure 2, which presents the Adaptive Learning Management Model.
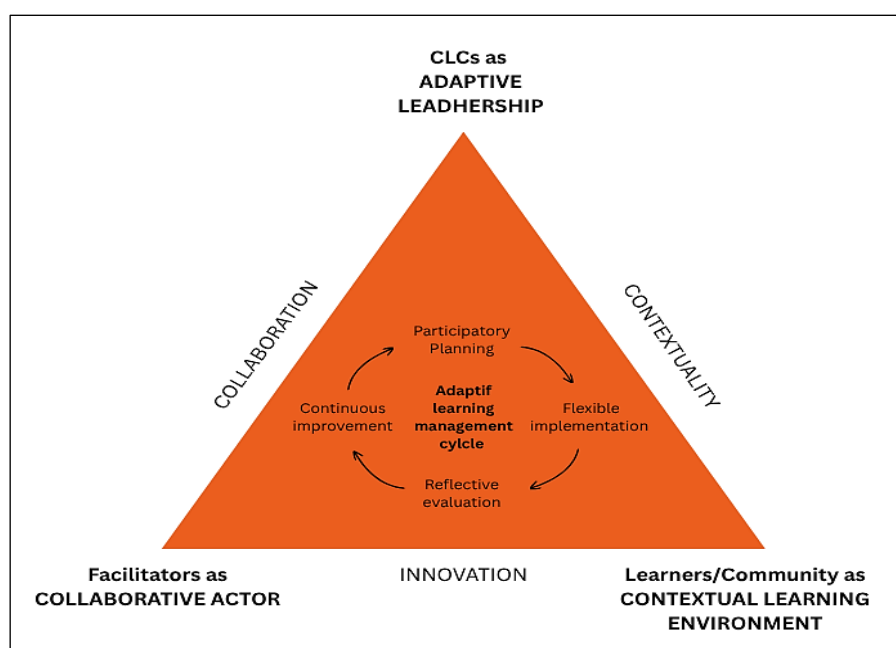
Figure 2: Adaptive Learning Management Model

Visually, the model can be represented as an interactive triangle connecting the three primary actors: institutional leadership, facilitators, and the learning community. At the center of the triangle lies the Adaptive Learning Management Cycle, which unfolds through four interrelated stages: participatory planning, flexible implementation, reflective evaluation, and continuous improvement. Each side of the triangle is interconnected through three core values: collaboration, innovation, and contextuality.

This triangular configuration signifies that adaptive learning management is not a hierarchical system, but a dynamic and dialogic structure built on mutual trust. The institutional head functions as a managerial facilitator rather than a controller; facilitators act as innovators and bridges linking the institution with the community; and the learning community participates as an active partner in shaping learning directions. These reciprocal relationships sustain a participatory ecosystem in which all actors share ownership of educational outcomes.

The model also integrates simple digital technologies such as WhatsApp, Google Forms, and short video content as connecting tools among the three actors. In contexts where infrastructure is limited, these tools do not replace social interaction but rather expand communication and documentation channels (43). This pragmatic use of technology highlights that the success of adaptive learning management depends not on advanced infrastructure but on the human capacity for adaptive intelligence the ability to creatively use available resources to maintain educational continuity and relevance. The findings corroborate literature on community-based adaptive learning, which emphasize that the effectiveness of non-formal education in rural and remote areas is determined by the institution's capacity to transform itself reflectively through inclusive leadership and community participation (44, 45). Both CLC SII and RBJ exemplify this principle: their innovations emerge not from top-down policy interventions, but from grassroots adaptive practices that evolve in response to contextual realities and community collaboration.

The adaptive learning management model for remote non-formal institutions is built through the integration of flexible leadership, autonomous facilitation, and contextual learning environments.

These three components form a living, responsive managerial system oriented toward community needs and sustainability. CLC SII demonstrates strength in community-based flexibility and individual creativity, while CLC RBJ excels in structured collaboration and institutional consistency. Together, they illustrate a complementary framework where adaptability, collaboration, and reflective learning become the core of effective non-formal education management in remote regions. This model reinforces the idea that sustainable educational innovation arises not from uniform structures but from adaptive human practices, where leadership empowers, facilitators innovate, and communities co-create learning within their own local realities. The findings offer several policy implications for strengthening remote-area non-formal education governance. Local governments should institutionalize flexible supervisory mechanisms, provide routine mentoring, and allocate micro-grants that support community-based learning initiatives. Digital subsidies for low-bandwidth communication tools are also essential for sustaining blended learning in rural environments. Furthermore, integrating CLCs into village development plans and establishing partnerships between CLCs, NGOs, and community organizations will enhance program sustainability and resource mobilization. Such policies are crucial to enabling facilitators to maintain adaptive learning systems under infrastructural and geographical constraints.

Conclusion

The effectiveness of learning management in remote non-formal education institutions largely depends on the adaptive capacity of the human actors involved, particularly institutional leaders, facilitators, and the learning community, in building a learning system that is flexible, participatory, and contextually grounded. Through the case studies of CLC SII and CLC RBJ, this research found that managerial adaptation emerges from a synergy between individual creativity and institutional support, where facilitators function not only as educators but also as innovators and social connectors bridging the institution and the community. The two CLCs demonstrate distinct yet complementary patterns of success. CLC SII excels in community-based

flexibility, while CLC RBJ is characterized by participatory structure and institutional consistency. Synthesizing these cases, the study formulates an adaptive learning management model that emphasizes inclusive leadership, facilitator autonomy, and a contextual learning environment through a four-phase cycle, that is participatory planning, flexible implementation, reflective evaluation, and continuous innovation. This model confirms that the success of non-formal education in remote settings is determined not merely by material resources but by the capacity of educational actors to apply the principles of collaboration, innovation, and continuous reflection as the foundation of a resilient and socially relevant institutional management system that responds to local community needs. The findings show that adaptive management in this context operates through facilitators' continuous professional learning, contextual adjustment of teaching practices, and collaborative negotiation with local stakeholders. These insights refine the theory by illustrating how adaptive management functions at the micro-level of daily educational practice in resource-limited settings.

Abbreviations

CLCs: Community Learning Centers, RBJ: Rurang Bulau Jaya, SII: Sejahtera Insan Indonesia.

Author Contributions

Afandi Rahman: primary conceptualization, design, analysation, data collection, preparation of the manuscript, Supriyono: supervision throughout the research process, validated the methodological approach, critical review of the manuscript, M Ishaq: refining the data analysis, improving the overall structure of the manuscript, Sri Wahyuni: literature review, interpretation of findings, proofreading of the final manuscript, Muslim Haidar: supported the contextual analysis, coordinated field activities, assisted in reviewing the methodological alignment. All authors have read and approved the final version of the manuscript.

Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this manuscript.

Declaration of Artificial Intelligence (AI) Assistance

Artificial Intelligence (AI) tools were used only to assist in improving the clarity of language, grammar, and formatting during manuscript preparation. AI tools were not used for data collection, data analysis, interpretation of findings, or drawing conclusions. All core ideas, conceptual frameworks, analyses, and final interpretations were developed entirely by the authors. The authors take full responsibility for the content of this manuscript.

Ethics Approval

This study adhered to ethical principles of research involving human participants. All participants were informed about the purpose of the study, and informed consent was obtained prior to data collection. Participation was voluntary, and confidentiality was strictly maintained. No personal identifying information was collected. Ethical approval was not required because the study did not involve interventions or sensitive data.

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