

EVALUATING CONTEXT AND ADAPTATION MECHANISMS OF THE SCHOOL MOBILIZATION PROGRAM IN REMOTE INDONESIA: A DEVELOPMENTAL EVALUATION APPROACH IN SUPIORI, PAPUA

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ABSTRACT

Program Sekolah Penggerak (PSP) is a major systemic educational reform in Indonesia designed to transform schools into hubs of high-quality, student-centered learning. However, implementing such a standardized national policy in Frontier, Outermost, and Remote regions presents severe geographic, digital, and infrastructural challenges that traditional, top-down evaluation models fail to capture. This study evaluates how the local implementation context in a 3T region influences the execution of PSP, identifies the local adaptation mechanisms triggered by regional actors, and analyzes the resultant school-level outcomes. Utilizing Michael Quinn Patton Developmental Evaluation framework and the Context-Mechanism-Outcome (CMO) heuristic, this qualitative study investigates the experience of Junior High Schools in Supiori Regency, Papua. Semi-structured interviews were conducted with key educational stakeholders, including the Head of the Education Office, school supervisors, and teachers. Data analysis was performed using thematic coding, validated by an NVivo-equivalent word frequency and node coding analysis to map coding densities. The findings reveal that, the implementation context was characterized by severe digital infrastructure gaps (e.g., intermittent internet and frequent power outages) and geographic isolation, local actors activated resilient adaptation mechanisms, including peer-led horizontal logistics networks and targeted regulatory incentives by the local education office, and the outcomes included significant contextual pedagogical innovations (e.g., coastal-based teaching media) and systemic school governance improvements (e.g., resolving teacher mismatching to achieve linear teaching distribution). By adapting standard program requirements to local socio-ecological realities, local agency transformed infrastructural limitations into opportunities for contextual learning and sustainable school improvement, providing a model for tailored educational policies in remote regions.

Keywords: program sekolah penggerak, 3T regions, context-mechanism-outcome, developmental evaluation, supiori papua

1. INTRODUCTION

Achieving sustainable improvements in educational quality remains a core objective of national development agendas worldwide. In the global arena, educational reform is increasingly pursued through systemic school transformation models (whole-school reform) designed to enhance classroom instruction, elevate teacher professionalism, and strengthen instructional leadership (Agirdag & MUIJS, 2023) (Reynolds & Neeleman, 2021). Modern educational research shows that schools are no longer effective when operated under rigid, top-down bureaucratic control. Instead, they must function as adaptive learning organizations capable of responding to local challenges (Ismail et al., 2021). However, contemporary literature on educational change highlights a recurring pattern: the failure of large-scale educational innovations is rarely a result of poor policy design. Rather, it stems from a lack of fit between the standardized requirements of the policy and the complex, localized socio-ecological contexts in which they are deployed (Hasiki, 2026)(Koh, Askill-williams, Barr, et al., 2023).

To address these implementation gaps and promote educational equity, the Ministry of Education, Culture, Research, and Technology of the Republic of Indonesia (Kemendikbudristek, 2022) launched the Merdeka Belajar policy suite. A major component of this reform is the Program Sekolah Penggerak (PSP), initiated in 2021 (Peraturan Menteri Pendidikan, Kebudayaan, Riset, Dan Teknologi Republik Indonesia Nomor 26 Tahun 2022 Tentang Pendidikan Guru Penggerak, 2022). PSP is designed as a systemic catalyst to transform school cultures through five key interventions: (1) consultative and asymmetrical coaching for local governments; (2) strengthening school leadership and teacher capacity through instructional leadership training; (3) introducing a student-centered curriculum (Kurikulum Merdeka) that focuses on deep learning and character development; (4) data-driven planning at the school level; and (5) school digitalization through the adoption of educational technology platforms (Peraturan Menteri Pendidikan, Kebudayaan, Riset, Dan Teknologi Republik Indonesia Nomor 26 Tahun 2022 Tentang Pendidikan Guru Penggerak, 2022). Rather than acting as passive recipients of aid, schools designated under the Program Sekolah Penggerak are structurally mandated to mentor and transfer best practices to surrounding non Sekolah Penggerak, thereby driving regional educational quality from the bottom up (Koh et al., 2023).

Although the Program Sekolah Penggerak is designed as a national initiative with standardized indicators, its local implementation occurs within highly unequal regional contexts (Aldridge & McLure, 2024). This divergence is particularly stark in Indonesia's Frontier, Outermost, and Remote (3T) regions, such as Supiori Regency in Papua. As an archipelagic regency, Supiori faces severe geographical challenges, including difficult sea transportation, limited electricity grid connections, and poor school infrastructure (Dr. David C. Harding, Basilius Bengoteku, 2014) (Rohmani et al., 2025).

Baseline educational quality indicators in Supiori reflect these structural limitations. According to the Supiori Regency Education Office (2022), the Net Enrollment Rate (APM) for junior high schools (SMP) was only 56%, while the School Participation Rate (APS) for children aged 13-15 was 67%. The national standardized school report card for 2022-2023

highlighted low student achievement: junior high school literacy scores stood at 1.36 and numeracy scores at 1.47 (on a maximum scale of 2.0). Only 17% of ninth-grade students achieved the minimum national standard in mathematics, while reading competency sat at 85% (SMP Rapor-Kab-Supiori, 2023/2024). This academic gap demonstrates the mismatch between the standardized expectations of the national curriculum and the actual academic foundations of students in remote schools.

Out of 13 Junior High Schools (SMP) in Supiori, only three were designated as Program Sekolah Penggerak implementers during the initial phase of the program. This selection process was unique because schools were not chosen based on physical infrastructure or digital readiness. Instead, the selection focused on the principal's commitment, human resource potential, and openness to instructional leadership (Wawancara Ibu Ona, 2024). Consequently, schools with minimal resources were tasked with implementing a digital-heavy transformation program, creating a significant gap between policy design and local reality.

The regional autonomy framework in Papua introduces a layer of political and cultural complexity. Under the Special Autonomy Law for Papua, local governments have unique mandates to preserve and integrate indigenous culture into public services, including education. This means that any national curriculum must not only be simplified for academic feasibility but also culturally adapted to reflect Papuan values, languages, and lifestyles. This socio-political reality demands that educational interventions are evaluated not on how closely they adhere to national administrative templates, but on how effectively they are translated to serve the local community.

Research on the Program Sekolah Penggerak has grown steadily since its launch (Afifah et al., 2023) (Rahayu, Rosita, Sri Rahayuningsih, et al., 2022). However, most empirical studies focus on urban or suburban schools in Java and Sumatra, where internet access is stable, teacher shortages are rare, and logistical networks are well-established (Wiryatmo et al., 2023). These studies primarily evaluate administrative compliance, teacher perceptions of the new curriculum, or general training obstacles. There remains a lack of detailed research on how PSP operates in remote, resource-constrained archipelagic regions like Supiori, Papua.

Methodologically, educational program evaluation in Indonesia continues to rely on quantitative input-output models or compliance-oriented summative evaluations. These traditional approaches often overlook the qualitative dynamics, local adaptations, and agency of educators working under challenging conditions (Nielsen et al., 2022) (Renmans & Pleguezuelo, 2023). In complex educational settings, program success depends heavily on the interactions between the local environment and the adaptation strategies developed by educators at the grassroots level (Fullan, 2020).

To address these empirical and methodological gaps, this study employs Patton (2011) Developmental Evaluation (DE) framework, combined with the Context-Mechanism-Outcome (CMO) heuristic from realist evaluation (Nielsen et al., 2022). The DE approach focuses on tracking real-time adaptation, facilitating learning, and helping local stakeholders modify program implementation to fit complex, changing environments. By focusing on the qualitative aspects of program impact in Supiori, this paper examines how the local context in a 3T region

influences program implementation, identifies the local adaptation mechanisms triggered by educational actors, and analyzes the resulting outcomes in terms of pedagogical innovation and school governance.

2. LITERATURE REVIEW

2.1 Systemic School Reform and Adaptive Learning Organizations

The literature on systemic school reform emphasizes that educational improvement is not simply a matter of introducing new policies, curricula, or administrative procedures. Rather, school improvement depends on the interaction between leadership, teacher professionalism, instructional culture, institutional capacity, and the broader socio-ecological environment in which schools operate. Whole-school reform models are designed to improve classroom instruction, strengthen teacher learning, and enhance instructional leadership across the entire organization (Agirdag & MUIJS, 2023) (Reynolds & Neeleman, 2021). Contemporary educational research also highlights the limitations of rigid, top-down reform models. Schools are increasingly expected to function as adaptive learning organizations that are capable of responding to changing student needs, local challenges, and policy demands (Harris et al., 2021). In this perspective, educational reform cannot be understood as a linear process in which policy is designed at the national level and then simply implemented at the school level. Instead, reform is shaped by negotiation, interpretation, adaptation, and local problem-solving.

This perspective is important for understanding the implementation of national reform programs in diverse regional contexts. The failure of large-scale educational innovation is rarely caused only by weak policy design. More often, implementation difficulties emerge from a lack of fit between standardized policy requirements and the complex realities of local schools (Aldridge & McLure, 2024) (Koh, Askeel-williams, & Barr, 2023). When local infrastructure, teacher capacity, school culture, and community conditions are not sufficiently considered, reform programs may create additional administrative burdens rather than meaningful instructional improvement.

The relevant literature therefore suggests that school improvement must be analyzed as a dynamic process. Leadership, professional learning, infrastructure, school culture, and local agency interact to determine how reform is interpreted and enacted in practice. This theoretical position provides the basis for examining why the Program Sekolah Penggerak requires contextual adaptation in Supiori rather than simple replication of a national model.

2.2 The Program Sekolah Penggerak and the Merdeka Belajar Policy

The Program Sekolah Penggerak is a major component of the Merdeka Belajar policy suite introduced by the Ministry of Education, Culture, Research, and Technology of the Republic of Indonesia. Initiated in 2021, the program is designed to accelerate school transformation by strengthening the role of school leaders, improving teacher capacity, supporting student-centered learning, encouraging data-driven planning, and promoting the use of educational technology (Peraturan Menteri Pendidikan, Kebudayaan, Riset, dan Teknologi Republik Indonesia Nomor 26 Tahun 2022 tentang Pendidikan Guru Penggerak, 2022).

Within this framework, PSP operates through five major interventions: consultative and asymmetrical coaching for local governments; strengthening school leadership and teacher capacity; implementing Kurikulum Merdeka; supporting data-based school planning; and encouraging school digitalization. These interventions indicate that PSP is not only a curriculum reform, but also a school transformation strategy that integrates leadership, pedagogy, governance, and technology. Schools designated under the Program Sekolah Penggerak are expected to serve as catalysts for broader educational improvement by sharing good practices with surrounding non-PSP schools.

Research on the implementation of PSP and Kurikulum Merdeka shows that the success of the program depends strongly on school leadership, teacher readiness, understanding of curriculum philosophy, and the availability of support systems. Rahayu et al. found that the implementation of Kurikulum Merdeka in Sekolah Penggerak had begun to run well, but still faced challenges related to teacher understanding, preparation, and practical implementation (Rahayu, Rosita, Rahayuningsih, et al., 2022). Meanwhile Wiryatmo, Iriani, and Waruwu, using the CIPPO evaluation model, also highlight that the strengthening of human resources is a critical component in PSP implementation, particularly in ensuring that principals and teachers are prepared to translate policy into school-level practices (Wiryatmo et al., 2023).

2.3 Education in 3T Regions, Digital Divide, and Contextual Inequality

Education in (3T) Regions cannot be understood only through national standards, curriculum targets, or administrative indicators. Schools in these regions operate within complex geographical, infrastructural, social, and cultural conditions that directly shape policy implementation. Literature on educational reform shows that standardized policies often encounter implementation gaps when they are applied in contexts with unequal institutional capacity and limited infrastructure (Aldridge et al., 2024). Therefore, educational reform in 3T region requires more than policy transfer from the national level to the school level. It requires contextual interpretation, local adjustment, and institutional flexibility so that national programs can function within uneven regional realities.

The literature on educational inequality shows that regional disparities influence school capacity in multiple ways. Limited transportation, unstable electricity, inadequate facilities, teacher shortages, and weak access to professional development can affect the ability of schools to implement reform programs consistently (Rohmani et al., 2025). In 3T region, these challenges are not temporary obstacles but structural conditions that shape the daily work of principals, teachers, students, and local education offices. This means that the implementation of national education reform must be examined through the interaction between policy expectations and local capacity. As Aldridge et al. argue, educational reform can deepen inequality when policy design assumes equal access to institutional resources across different regional contexts.

The regional autonomy framework in Papua introduces a layer of political and cultural complexity. Under the Special Autonomy Law for Papua, local governments have unique mandates to preserve and integrate indigenous culture into public services, including education. This means that any national curriculum must not only be simplified for academic feasibility

but also culturally adapted to reflect Papuan values, languages, and lifestyles. This socio-political reality demands that educational interventions are evaluated not on how closely they adhere to national administrative templates, but on how effectively they are translated to serve the local community.

The digital divide is one of the most important issues in the implementation of contemporary education reform. Digital-based policies often assume that schools have stable internet access, reliable electricity, sufficient devices, and teachers who are ready to use digital platforms. However, in many daerah 3T, these assumptions do not fully match school realities. Studies on digital inequality indicate that technology-based educational reform can create uneven implementation burdens when infrastructure readiness is not equally distributed (Aldridge & McLure, 2024). When national programs require digital reporting, online training, and platform-based learning without ensuring adequate infrastructure, schools in remote areas may experience additional administrative pressure. Teachers and school leaders may be forced to spend considerable time solving technical problems instead of focusing on instructional improvement.

This situation creates what may be understood as a secondary digital gap. The first gap concerns access to devices, internet, and electricity. The second gap concerns the unequal burden experienced by schools that are required to comply with digital administrative systems despite limited infrastructure. In this condition, digitalization may unintentionally widen inequality if it is not accompanied by contextual support, infrastructure readiness, and flexible implementation mechanisms. This argument is consistent with the view that educational technology should not be evaluated only by the existence of platforms, but also by the capacity of schools to use those platforms meaningfully, equitably, and sustainably (Nielsen et al., 2022)

2.4 Developmental Evaluation and Context-Mechanism-Outcome Logic

To appreciate the distinct utility of *Developmental Evaluation*, it must be contrasted with traditional formative and summative evaluation models. Traditional formative evaluations are designed to improve programs that operate within relatively stable environments, whereas summative evaluations assess the overall effectiveness of completed interventions for accountability purposes. In contrast, *Developmental Evaluation* (DE) is specifically designed for complex, emergent, and continuously evolving situations in which innovation and adaptation are integral to program implementation. Rather than functioning as external judges of compliance, developmental evaluators work collaboratively with stakeholders by providing real-time feedback that supports continuous learning and program adaptation.

Patton (2011) identifies eight principles that characterize Developmental Evaluation: (1) developmental focus, (2) systems thinking, (3) co-creation with stakeholders, (4) real-time feedback, (5) attention to complexity, (6) continuous adaptation, (7) utilization-focused learning, and (8) rigorous documentation of decision-making processes. These principles provide the conceptual foundation for understanding how the Program Sekolah Penggerak evolves within complex local contexts such as Supiori, where implementation is continuously shaped by geographical, infrastructural, and institutional conditions (Patton Michael, 2011).

To organize the empirical findings, this study adopts the Context-Mechanism-Outcome (CMO) heuristic as an analytical lens (Nielsen et al., 2022) (Renmans & Pleguezuelo, 2023). Within the *Developmental Evaluation* process, the CMO heuristic helps explain how particular contextual conditions (Context) trigger adaptive responses from local actors (Mechanism), which subsequently contribute to observable educational changes (Outcome). In this study, CMO is not employed as a separate evaluation model but as an analytical framework that complements *Developmental Evaluation* by systematically explaining how local adaptation processes influence pedagogical innovation and school governance in the implementation of the Program Sekolah Penggerak.

2.5 Local Adaptation, Place-Based Pedagogy, and School Governance

Local adaptation is a central concept in understanding how national education reform is implemented in 3T Regions. In contexts marked by geographical isolation, limited infrastructure, unstable digital access, and uneven human resources, schools cannot simply reproduce national policy requirements in a uniform manner. They need to interpret, adjust, and translate reform goals into practices that are feasible within local conditions. Therefore, adaptation should not be understood as a deviation from policy, but as a necessary process through which policy becomes workable in complex school environments.

In the implementation of the Program Sekolah Penggerak, local adaptation may occur through informal collaboration, resource sharing, flexible scheduling, contextual use of learning materials, and negotiation between schools and local education authorities. In remote and resource-constrained areas, social capital and mutual trust among school leaders, teachers, supervisors, and local officials become important resources for sustaining reform implementation. Collaborative practices can reduce logistical barriers, support the circulation of teaching resources, and help schools respond to constraints that cannot be solved by individual institutions alone. This perspective is consistent with the literature on educational leadership and school improvement, which emphasizes that reform continuity depends not only on formal policy instruments but also on professional collaboration, trust, and shared responsibility among educational actors (Harris et al., 2021) (Koh, Askill-williams, & Barr, 2023).

Local education governance also plays an important role in supporting adaptation. In a highly centralized or compliance-oriented system, local administrators may function mainly as enforcers of national directives. However, in complex and resource-limited contexts, local education offices need to act as supportive intermediaries between national policy expectations and school-level realities. This intermediary role can protect schools from excessive administrative pressure and create space for principals and teachers to focus on instructional improvement. Hargreaves and Shirley argue that educational change requires professional trust and responsive leadership rather than excessive bureaucratic control (Hargreaves & Shirley, 2021). In line with *Developmental Evaluation*, flexible and responsive leadership is important because it supports ongoing learning, adjustment, and program continuity under uncertain conditions (Q. Patton et al., 2012).

Place-Based Education (PBE) provides another important lens for understanding local adaptation in teaching and learning. PBE emphasizes the use of local environment, culture, community life, landscapes, and local problems as meaningful sources of learning. In remote and indigenous regions, this approach is especially relevant because it recognizes local knowledge and connects school subjects with students' lived experiences. Rather than depending entirely on digital resources or standardized teaching materials, teachers can draw on the surrounding environment, local livelihoods, cultural practices, and community knowledge to support student-centered learning. This approach aligns with the spirit of Kurikulum Merdeka and Projek Penguatan Profil Pelajar Pancasila (P5), which emphasize contextual, collaborative, and meaningful learning.

In 3T Regions, place-based pedagogy can also help reduce the gap between national curriculum expectations and local learning realities. When teachers use locally available resources as learning media, they are not lowering academic standards but translating curriculum goals into forms that are accessible and meaningful for students. This is especially important in schools where digital infrastructure is limited. Contextual pedagogy allows teachers to maintain the principles of student-centered learning while adapting instructional strategies to the material, cultural, and environmental resources available in the community.

School governance is also closely related to teacher assignment and professional capacity. In resource-constrained schools, teacher shortages and teacher mismatching often affect instructional quality. Teacher mismatching occurs when educators are required to teach subjects outside their academic specialization because of limited staffing. This condition can weaken teacher confidence, reduce instructional depth, and create difficulties in curriculum planning. Therefore, improving teacher assignment and strengthening subject linearity are important aspects of school governance. When teachers are assigned according to their academic expertise, schools are more likely to improve instructional quality, professional confidence, and curriculum coherence (Agirdag & MUIJS, 2023).

The relationship between local adaptation, place-based pedagogy, and school governance shows that school improvement in 3T Regions is not produced by policy design alone. It emerges through the interaction between national reform goals, local leadership, teacher agency, community resources, and institutional support. This perspective positions the implementation of the Program Sekolah Penggerak in Supiori as a complex educational reform process. The contribution of this study lies in explaining how local context generates adaptation mechanisms and how those mechanisms produce outcomes in pedagogy, teacher assignment, and institutional autonomy.

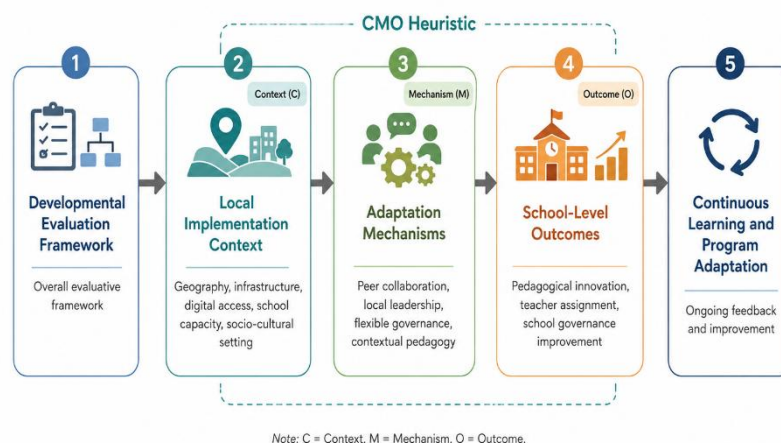
3. METHODS

This study employed a qualitative evaluative research design based on Patton's Developmental Evaluation (DE) framework. A qualitative evaluative design was considered appropriate because the study aimed to understand how the Program Sekolah Penggerak was interpreted, adapted, and implemented within a complex local context rather than merely measuring program effectiveness through predetermined indicators (John W. Creswell, 2016); (M. Q. Patton, 2023). DE was selected because the implementation of educational reform in 3T

Regions occurs within dynamic and uncertain environments marked by geographical isolation, limited infrastructure, unstable digital access, and uneven school capacity. In such contexts, rigid compliance-based evaluation is insufficient because it cannot fully capture adaptation, local decision-making, and emergent implementation processes (Patton Michael, 2011).

To guide the analytical process, this study integrated the Context-Mechanism-Outcome (CMO) heuristic as an analytical lens. CMO was used to organize and explain the relationship between local conditions, adaptation processes, and school-level changes. In this study, context refers to the geographical, infrastructural, institutional, and socio-cultural conditions that shaped the implementation of the Program Sekolah Penggerak; mechanism refers to the adaptive responses activated by local actors; and outcome refers to the pedagogical and governance changes that emerged from these adaptation processes ((Nielsen et al., 2022);(Renmans & Pleguezuelo, 2023)). CMO was not used as a separate evaluation model, but as an analytical framework that complemented Developmental Evaluation by explaining how and why adaptation occurred within a specific implementation context.

Figure 1. Developmental Evaluation and CMO Analytical Procedure



Developmental Evaluation provided the overall evaluative framework for examining adaptation, learning, and program development in a complex implementation setting. The CMO heuristic organized the analysis by linking the local implementation context of Supiori, the adaptation mechanisms developed by educational actors, and the resulting outcomes in pedagogy and school governance. Through this procedure, the study did not merely assess whether the Program Sekolah Penggerak was implemented according to national standards, but explained how and why implementation evolved within the specific conditions of a 3T Region.

Research Setting and Selection

The study was conducted at the three Junior High Schools (SMP) designated as PSP implementers in Supiori Regency, Papua: SMP Negeri 3 Soweke, SMP Negeri 1 Supiori Timur, and SMP Negeri 2 Supiori Barat. These schools represent the geographic variation of the regency, including both mainland and island settings. Fieldwork was conducted periodically

from August 2024 to early 2026 to evaluate the long-term sustainability of the practices developed during the program.

The setting of SMP Negeri 3 Soweik presents a unique geographical context. Soweik is a small island district in Supiori where the local community primarily resides in houses built on stilts over the shallow waters. Students and teachers must commute to school daily using traditional wooden rowboats or small motorized canoes. During monsoon seasons, high sea swells and heavy rains often render transportation between the islands and the mainland highly hazardous, resulting in temporary school closures or high student absenteeism. This physical environment shapes the school's operational capacity, highlighting the challenges of implementing national reforms designed for schools on land with continuous road access. Meanwhile, SMP Negeri 1 Supiori Timur and SMP Negeri 2 Supiori Barat are located on the mainland but still face poor road conditions and lack public transportation, forcing students to walk long distances to attend classes. These physical parameters illustrate that the context (C) is defined not only by digital isolation but by substantial physical and geographic friction that limits access to basic educational services.

Informants were selected using purposive sampling to ensure representation across administrative, supervisory, and teaching levels:

1. Policy Level Informant (Head of the Supiori Regency Education Office): Provided data on regional budgeting, local regulations, and administrative support.
2. Supervisory Level Informant (SMP School Supervisor - Ibu Ona): Provided data on the implementation process, teacher capacity building, and school monitoring.
3. Implementation Level Informants (School Principal & Teacher): Included Ibu Riana Betoni (Principal of SMP Negeri 3 Soweik) and Ibu Martha (subject teacher), who provided data on classroom instruction, curriculum adjustment, and school-level changes.

Primary and secondary data were gathered through three main methods:

1. In-Depth Interviews: Semi-structured interviews were conducted with all key informants. The interview protocols focused on geographical barriers, digital challenges, adaptation strategies, and shifts in teaching behavior. Interviews were recorded and transcribed verbatim.
2. Field Observations: The researchers conducted non-participant observations in the classrooms of the participating schools to evaluate student-centered instruction, place-based learning media, digital infrastructure conditions, and mentoring activities.
3. Document Analysis: Official documents were analyzed, including the regional Rapor Pendidikan (2022-2024), school performance reports, local teacher training guidelines, and contextualized lesson plans developed by the teachers.

Data Analysis and Trustworthiness

Qualitative data were analyzed using thematic analysis, assisted by qualitative data analysis software. The analysis process followed five steps: (1) data familiarization through multiple transcript readings; (2) initial coding of relevant text segments; (3) categorization of codes into

Context, Mechanism, and Outcome themes; (4) generating a node coding matrix to assess coding density; and (5) synthesizing the findings into the CMO matrix.

To ensure trustworthiness, the study applied Lincoln and Guba's four criteria (Patton Michael, 2011) (Nielsen et al., 2022):

1. **Credibility:** Achieved through source triangulation (comparing perspectives of the head of office, supervisor, and teachers) and method triangulation (comparing interviews, observations, and documents), as well as member-checking with key participants.
2. **Transferability:** Addressed by providing a detailed description of the geographical, infrastructural, and socio-educational context of Supiori so the findings can guide educational interventions in similar remote archipelagic regions.
3. **Dependability:** Maintained through an audit trail documenting the research steps, including transcriptions, coding structures, and analysis decisions.
4. **Confirmability:** Managed by regular researcher reflection to minimize personal bias and ensure that the findings reflect the data collected.

4. RESULTS AND DISCUSSION

Context (C): Archipelagic Geography, Digital Divide, and Educational Baseline in the 3T Region

The implementation of Program Sekolah Penggerak in Supiori, Papua, occurred within a highly constrained geographical and technological environment. As an archipelagic regency, Supiori's islands are separated by sea, making physical travel and resource distribution dependent on weather and boat availability. This isolation limits physical oversight and increases the cost of school operational logistics.

The digital divide presented the most immediate challenge to the program's technology-dependent design. The national program requires regular use of digital platforms (e.g., PMM, Rapor Pendidikan, belajar.id) for teacher training and school administration. In Supiori, however, internet connectivity is unstable and electricity blackouts occur regularly, lasting from hours to days. This digital gap is reflected in the thematic word frequency analysis of the interview transcripts (Table 1). The high count of terms like facility 52 times, obstacle 41 times, network 32 times, and internet 20 times demonstrates that infrastructural challenges were a primary concern for local educators.

Table 1. Word Frequency Analysis: 15 Dominant Keywords (Supiori Context)

No	Keyword (Indonesian)	Translation	Count	Percentage (%)
1	Sekolah	school	84	5.42%
2	penggerak	mobilizer	78	5.03%
3	Guru	teacher	64	4.13%
4	Fasilitas	facility	52	3.35%
5	Supiori	Supiori	46	2.97%
6	Kendala	obstacle	41	2.65%
7	anggaran	budget	35	2.26%
8	Jaringan	network	32	2.06%
9	Belajar	learn	30	1.94%
10	Dinas	office/dept	28	1.81%
11	adaptasi	adaptation	25	1.61%

No	Keyword (Indonesian)	Translation	Count	Percentage (%)
12	Kepala	head/leader	24	1.55%
13	Program	program	22	1.42%
14	Internet	internet	20	1.29%
15	Linear	linear	18	1.16%

The Head of the Education Office explained how these infrastructure gaps affected administrative compliance:

"The availability of the internet on the islands is not as smooth as in the city, not to mention power outages... These kinds of physical obstacles in the field are what we face when we have to access the ministry's learning platforms. The national program often demands that we upload reports or report card data on time, even though here electricity can be out all day and signals vanish for days if the weather is bad."

This technological challenge shows that national policies assuming uniform digital access create administrative friction in remote regions.

Furthermore, students' academic baseline presented another challenge. With initial literacy scores at 1.36 and numeracy scores at 1.47 (on a 2.0 scale), teachers could not immediately implement the advanced student-centered modules designed for national use. Instead, they had to adapt their lessons to address basic literacy gaps first, highlighting the distance between national curriculum design and remote classroom realities (*SMP RAPOR-KAB-SUPIORI-2024 (I)*, N.D.).

Literature on the digital divide (Aldridge et al., 2024) (Rohmani et al., 2025). indicates that digital-heavy educational reforms can worsen disparities for remote schools if baseline infrastructure is ignored. Standardized national requirements can impose administrative burdens on educators who must spend limited time and energy resolving connectivity issues rather than focusing on teaching.

In developing countries, this challenge is often framed within the debate on digital justice. When the state mandates the digitalization of public services without establishing the necessary electrical and network infrastructure, it creates a secondary digital gap. The policy penalizes schools for failing to comply with administrative metrics that depend on resources outside their control, changing the focus of school evaluations from instructional quality to technical troubleshooting.

Mechanism (M): Resilient Adaptation, Collective Logistics, and Regional Policy Flexibility

In response to these geographical and digital barriers, local educators developed informal adaptation mechanisms (M) to sustain the program. These mechanisms were designed to fit the program's goals to the local capacity of the schools. The node coding analysis (Table 2) shows that references to these adaptation mechanisms were highly frequent (34 total references), with the highest density in the Head of Education Office's transcripts (15 references), indicating active administrative adjustment at the local level.

Table 2. Thematic Node Coding Summary

Theme / Node	Total References	Informant 1 (Kadis)	Informant 2 (Pengawas)	Informant 3 (Guru/Kepsek)
Konteks Hambatan 3T (Context)	28	12 references	10 references	6 references
Mekanisme Adaptasi (Mechanism)	34	15 references	11 references	8 references
Dampak Hasil Kualitatif (Outcome)	22	8 references	9 references	5 references

Two primary adaptation mechanisms were identified:

1. Horizontal Collective Logistics Networks

Because of high transport costs and shipping challenges, individual schools avoided independent procurement of curriculum books and digital equipment (e.g., Chromebooks, projectors). Instead, the schools formed a collective logistics network. Principals delegated a single representative to procure and transport all required materials for all participating schools together. School supervisor Ibu Ona described this process:

"We send one school principal to buy all the needs and bring them here... the cost is much cheaper and equal for all mobilized schools on the island. If done individually, the transportation costs would be exhausted on the way. The representative goes to the nearest city or coordinates with suppliers in Jayapura to bring all logistics using motorboats together. This kind of tactic is not in the guidelines, but if we didn't do it, the schools on the island would never have the school mobilization program books."

This collaborative strategy reduced transactional and transport costs, enabling remote schools to acquire physical teaching materials on time (Koh et al., 2023). It shows that social capital and mutual trust among school leaders are key resources for policy implementation in remote areas.

This horizontal model is an example of the co-creation of solutions identified in DE theory. When formal channels fail due to geographical friction, local actors rely on their social relationships to construct informal networks. By pooling their financial resources (derived from the BOS Kinerja budget) and coordinating a singular procurement channel, they bypass the high costs of individual logistics. The activation of this peer-support mechanism demonstrates that local collaboration can compensate for infrastructural deficits.

2. Adaptive Local Policy and Flexible Administrative Oversight

The Supiori Education Office adjusted its administrative requirements to reduce pressure on teachers. The office allowed schools to skip daily digital platform logging when internet access was unavailable. Furthermore, the office evaluated teacher performance through classroom observations rather than digital platform activity. The Head of the Education Office explained the reasoning behind this shift:

"We from the Office must continue to be present to motivate teachers to change their mindset, and then ensure that all changes that happen first benefit the teachers themselves... We prepare concrete policies: if you can complete this, what benefit will you get... We facilitate regulation at the regional level to ease their administrative burden. We don't want our teachers to be stressed just because they cannot upload documents due to internet power outages. The most important thing for us is that they enter classrooms, children learn, and teachers teach with heart."

This regulatory flexibility protected teachers from administrative pressure and allowed them to focus on instruction (Harris et al., 2021). The local agency acted as a buffer between national compliance demands and local operational limits (Hargreaves & Shirley, 2021). This local adjustment aligns with DE principles, which emphasize that flexible, responsive leadership supports program continuity under challenging conditions (Patton Michael, 2011).

In the literature on educational governance, this buffering function is recognized as a protective strategy during systemic reforms. In typical bureaucratic systems, local administrators enforce central directives regardless of local capacity. However, in Supiori, the local office modified its role from a compliance regulator to a supportive administrator. By adjusting the administrative requirements, the office reduced the stress placed on teachers, giving them the space needed to adapt the new curriculum.

Outcome (O): Place-Based Pedagogy, Structural Alignment, and Institutional Autonomy

The combination of local context constraints and adaptation mechanisms resulted in several positive outcomes (O) for classroom instruction and school organization.

1. Place-Based Coastal Pedagogy

Due to the lack of internet access and lab equipment, teachers adapted the Kurikulum Merdeka by using the local coastal environment and traditional culture as teaching resources. In science lessons, teachers replaced digital simulations with field observations of the local beach ecosystem. Ibu Martha, a subject teacher, shared her experience:

"Regarding changes, as a religion teacher, I received new innovations. For example, collaborating with phase colleagues... The learning can be synchronized according to the context where I teach. We can teach with contextual media here, such as using the coastal environment and local culture for learning materials. Children are much more enthusiastic because what they learn is what they see every day on the beach in front of their houses."

This shift indicates that physical limitations encouraged teachers to design contextual, place-based lessons that connected curriculum standards with students' daily lives (Afifah et al., 2023) (Rahayu, Rosita, Sri Rahayuningsih, et al., 2022).

The use of local environments for instruction represents a form of Place-Based Education (PBE). PBE emphasizes using the local heritage, culture, landscapes, and opportunities as a foundation for study. In remote, indigenous regions like Papua, PBE is particularly valuable because it validates local knowledge and connects school subjects to community life. When

teachers use the ocean shore to teach biological classifications, they respect the cultural experiences of their students while meeting national academic standards. This adaptation demonstrates how curriculum requirements can be met without digital resources.

2. Structural Realignment of Teacher Assignments

A persistent challenge in remote schools is the mismatch between a teacher's academic background and their teaching assignments due to staff shortages. Under the program, participating schools reorganized their staff schedules to align teaching assignments with teacher specializations. School supervisor Ibu Ona noted this change:

"In the mobilized schools themselves, the teachers are already teaching according to their fields (linear). If it's junior high school, it must be aligned. So for instance, if she is a biology graduate, then she can teach science (MIPA). There are no more religion teachers double-hatting to teach mathematics... Surely if it has been established as a mobilized school, it has been arranged like that. This arrangement makes the quality of materials received by students much higher."

This reorganization ensured that classes were taught by teachers with relevant subject expertise, improving the quality of instruction (Agirdag & MUIJS, 2023). Before this structural alignment, teacher misassignment (where educators were forced to teach outside their degree fields due to staff shortages) was the norm. This practice not only lowered instructional quality but also eroded teacher confidence, as they had to present content they did not master. By restructuring teacher to align with their academic specialties (subject linearity), the schools established a professional standard. This alignment gave teachers a sense of competence and credibility in front of their classes. It also simplified curriculum planning, as teachers could leverage their university backgrounds rather than learning new subjects from scratch. Consequently, resolving teacher mismatching was a key systemic outcome that directly improved classroom delivery and educational quality in the 3T schools.

3. Institutional Autonomy and Local Communities of Practice

The evaluation showed that these organizational changes remained active after formal program facilitation concluded. Schools established self-directed professional learning communities to support collaboration. Ibu Riana Betoni, Principal of SMP Negeri 3 Sowek, described this development:

"...coincidentally, our school has been in the school mobilization program since 2021. The change in the mindset of teachers and the principal is what remains most permanent. We learn to collaborate, compile project modules (P5) together, and disseminate these best practices to non-mobilized schools around us... The impact is permanent because the system has already been formed in the school. We no longer wait for instructions from Jakarta or the office to hold weekly reflection meetings; our teachers are used to sitting together to evaluate their teaching independently."

This shift shows a transition from reliance on external guidance to local professional autonomy, helping the school function as a self-sustaining learning organization (Koh, Askill-williams, & Barr, 2023).

Synthesis and Discussion: Connecting Context, Mechanism, and Outcomes

The qualitative findings show how context, mechanisms, and outcomes interact during educational reform in Supiori, Papua. Physical and digital infrastructure challenges (C) did not halt the program. Instead, they prompted school leaders to collaborate on logistics and motivated the local education office to adjust administrative requirements (M). These adaptation strategies, in turn, supported the development of place-based lessons, the alignment of teacher assignments, and the formation of collaborative teacher communities (O). This CMO relationship is summarized in Table 3.

Table 3. CMO Heuristic Matrix of PSP Implementation in Supiori

Context (C)	Mechanism (M)	Outcome (O)
Digital & Geographical Barriers: - Unstable internet connections - Frequent power outages - High transport costs between islands	Collective Logistics & Local Support: - Representative procurement of materials - Collaborative resource sharing - Personal administrative motivation	Contextual Innovation & Governance: - Reorganization to achieve linear teaching - Place-based curriculum adaptations - Sustainable, self-reliant school collaborations

This synthesis supports the theory that school improvement initiatives are successful when adapted to the organizational capacity of the local school (Fullan, 2020) (Koh, Askill-williams, Barr, et al., 2023). Standardized, top-down reforms often assume equal access to infrastructure (Aldridge et al., 2024). The Supiori case, however, indicates that remote schools must translate national policies to fit local realities.

Using a *Developmental Evaluation* framework (Patton Michael, 2011). highlights that program success under these conditions depends on flexibility rather than strict compliance. By reducing administrative reporting demands, the local education office created a "safe space" for teachers to adapt the curriculum. This safe space reduced the professional anxiety that often accompanies curriculum change (Hargreaves & Shirley, 2021). As a result, pedagogical innovations grew from the local socio-ecological context, making them more sustainable over time (Kmurawak et al., 2025) (Samhaji & Anggara, 2025).

The creation of this safe space is key to understanding the psychological dimensions of educational reform. Large-scale curricular changes often induce high anxiety among educators who feel unprepared or lack the required tools. Under top-down compliance models, this anxiety leads to resistance or superficial implementation. In Supiori, by providing administrative support and prioritizing classroom teaching over digital compliance, the local office helped reduce this anxiety. Teachers felt supported to experiment with the new curriculum, which fostered professional confidence and ownership of the instructional process.

5. CONCLUSION AND LIMITATION

This study evaluated the implementation of the Program Sekolah Penggerak (PSP) in the Junior High Schools of Supiori Regency, Papua, using a Developmental Evaluation approach and the CMO heuristic. The findings show that despite archipelagic logistics challenges and digital infrastructure gaps, local educators successfully adapted the program. Through collective procurement networks, flexible local policies, and place-based curriculum adjustments, educators established sustainable teaching and organizational practices. These adaptations indicate that local agency and administrative flexibility are essential for translating national educational reforms into effective practices in remote regions. The main limitation of this study is its qualitative focus on three junior high schools in one regency. Therefore, the findings are not intended for statistical generalization, but for analytical transferability to similar remote, archipelagic, and infrastructure-constrained educational contexts. Future research should employ mixed-methods designs to examine the relationships between leadership strategies, local infrastructure, teacher capacity, and student literacy or numeracy outcomes across wider samples of 3T districts in Indonesia.

Recommendations

The Ministry should establish flexible reporting policies for 3T regions. Standardized, digital-only reporting requirements should be modified to allow for offline documentation and qualitative performance indicators. This adjustment would reduce administrative pressure on teachers working in areas with unreliable internet and power infrastructure. The Supiori Education Office should continue supporting local policy adjustments that protect school autonomy. The office should allocate regional funds to support transportation for school supervisors and teachers in archipelagic districts, facilitating the dissemination of practices from the three mobilized schools to the remaining ten non-mobilized junior high schools in the regency. Principals should maintain local teacher collaboration networks to support professional development. Teachers should continue designing place-based lessons that use the local coastal environment and Papuan culture, creating relevant learning experiences for students without relying on digital tools. Because this study focused qualitatively on three junior high schools in a single regency, future research should use mixed-methods designs to evaluate the relationships between leadership strategies, local infrastructure, and student literacy outcomes across a wider sample of 3T districts in Indonesia.

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