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Learning Design and Implementation of Indonesia's Merdeka Curriculum in Primary Education: A Fourth-Grade Case Study

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ABSTRACT
This study analyzes the design, planning, and implementation of Indonesia's Merdeka Curriculum in fourth-grade instruction at SDN 6 Langkai, Palangka Raya. Employing a qualitative case study approach, data were collected through classroom observations, semi-structured interviews with fourth-grade teachers, and documentation of instructional modules and learning materials. Data analysis followed the Miles and Huberman model, comprising data reduction, data display, and conclusion drawing. Findings reveal that teachers adopted a pragmatic approach by adapting instructional modules from online resources, employing diverse teaching methods (discussions, lectures, games, assignments), and implementing spontaneous differentiation. However, integration of Higher-Order Thinking Skills (HOTS) and Technological Pedagogical Content Knowledge (TPACK) remained minimal due to insufficient technological infrastructure. Key challenges included low student motivation, insufficient textbooks, and disparities in digital access. Assessment practices predominantly emphasized summative rather than formative evaluation. Nevertheless, teachers demonstrated considerable creativity in adapting instructional strategies to local contexts. The study recommends continuous professional development, infrastructure enhancement, and systemic support for effective Merdeka Curriculum implementation.

INTRODUCTION

Education in Indonesia is undergoing continuous transformation to enhance learning quality and relevance to student needs. This transformation manifests through curriculum reforms that reflect contemporary developments and evolving student requirements. The Independent Learning Curriculum (Kurikulum Merdeka) is being progressively implemented across educational levels,

including elementary education. This curriculum embodies Dewey's (1961) educational philosophy, emphasizing flexible learning environments that afford students opportunities to explore their interests and realize their potential. The Independent Learning Curriculum addresses contemporary pedagogical challenges by providing educators with enhanced autonomy in designing and implementing meaningful learning experiences (Kemendikbudristek, 2022).

Instructional planning constitutes a fundamental prerequisite for quality educational processes. It encompasses a systematic decision-making process grounded in rational analysis of specific learning objectives, behavioral modifications, and requisite activities to achieve predetermined goals through optimal utilization of available pedagogical resources. Comprehensive and systematic planning directly determines classroom learning effectiveness. However, achieving effective classroom learning presents substantial challenges, particularly concerning new curriculum implementation. Mulyasa (2013) contends that curricular reform extends beyond content modification to encompass paradigmatic shifts in approaches, strategies, and pedagogical methodologies. Consequently, successful implementation necessitates comprehensive preparation from educational stakeholders, particularly teachers who serve as primary curriculum implementers.

Elementary education, specifically at the fourth-grade level, presents distinctive characteristics in instructional planning and implementation. According to Piaget's cognitive development framework, fourth-grade students operate within the concrete operational stage, characterized by emerging logical thinking capabilities while maintaining dependence on concrete manipulatives for learning (Santrock, 2011). Therefore, instructional design must accommodate students' developmental characteristics to optimize learning objective achievement.

The Independent Curriculum advocates student-centered pedagogical approaches that grant teachers flexibility in developing context-specific and needs-responsive learning instruments. Uno (2011) emphasized that effective instructional planning must integrate multiple considerations: student needs analysis, learning objective formulation, strategy and method selection, and evaluation system development. However, empirical evidence indicates disparate levels of institutional preparedness for implementing this pedagogical framework.

Teaching module development represents a primary implementation challenge within the Independent Curriculum. Teaching modules constitute systematically designed instructional tools employing accessible language to facilitate meaningful learning aligned with student characteristics and institutional contexts. Research demonstrates that developing contextual materials responsive to student needs significantly enhances motivation and learning outcomes by enabling students to establish connections between theoretical knowledge and practical applications (Bungai et al., 2023; Johnson, 2002). Nevertheless, practical constraints including limited pedagogical capacity and resource availability result in many educators relying on publicly available materials rather than developing customized modules. Additionally, technology integration in instruction, conceptualized as TPACK (Technological Pedagogical Content Knowledge), constitutes an essential competency for twenty-first-century educators. Teachers must possess integrated knowledge of technology, pedagogy, and content to create effective learning experiences. However, infrastructural limitations and restricted technological access in certain institutions impede effective implementation.

Higher-order thinking skills (HOTS) development represents another critical focus of the Independent Curriculum. Anderson and Krathwohl's (2001) revised Bloom's taxonomy positions analytical, evaluative, and creative abilities at the apex of cognitive development objectives. HOTS-oriented instruction is intrinsically linked to critical thinking development, which encompasses analyzing and evaluating diverse perspectives to formulate rational and reflective judgments (Rahmawati et al., 2019). However, implementing HOTS-based pedagogy requires specialized teacher competencies in designing appropriate learning activities and assessments. Learning evaluation incorporating reflection and feedback mechanisms constitutes an integral component of the instructional cycle. Research

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indicates that effective feedback significantly impacts student learning outcomes. Consequently, educators must design assessment systems that simultaneously measure learning achievement and generate diagnostic information for instructional refinement.

Within this context, SDN 6 Langkai, Palangka Raya an institution implementing the Independent Curriculum at the fourth-grade level encounters multifaceted challenges in instructional planning and implementation. This study examines the design and classroom implementation of learning plans while identifying implementation obstacles. The findings aim to provide empirical insights into Independent Curriculum implementation at the elementary level and generate evidence-based recommendations for instructional quality enhancement.

METHOD

Research Design and Setting

This study employed a qualitative single-case study design to develop comprehensive insights into the planning, design, and implementation of the Independent Curriculum at the fourth-grade level (Creswell, 2014; Yin, 2014). The research site, SDN 6 Langkai (RTA Milono Km. 3.5, Pahandut District, Palangka Raya City), was selected through purposive sampling based on its implementation of the Independent Curriculum at the fourth-grade level.

Participants

Participants comprised the Grade 4 teacher, serving as the primary informant responsible for instructional planning and implementation, and Grade 4 students (n=38), whose learning processes were observed. Following Patton's (2002) framework, the teacher was selected as a key informant based on specialized pedagogical knowledge and willingness to share professional experiences.

Data Collection

Data were collected through three techniques (observation, interviews, and documentation) to ensure methodological triangulation and enhance data validity. Non-participant observation was conducted in Grade 4, examining: (a) teacher-student interactions, (b) instructional media and technology utilization, (c) pedagogical strategy implementation, and (d) assessment and feedback mechanisms (Spradley, 1980). Semi-structured interviews with the classroom teacher employed an interview protocol addressing five domains: (1) instructional planning components (dimensions, themes, temporal allocation, teaching modules, strategies, models, and media); (2) development of learning objective sequences aligned with student needs; (3) instructional design integrating HOTS and TPACK frameworks; (4) assessment processes incorporating reflection and feedback; and (5) implementation challenges and solutions. Documentary evidence comprised instructional materials (teaching modules and textbooks), visual documentation (photographs and videos of classroom activities), and institutional data. Observational data were documented through field notes, interview data were fully transcribed, and documentary evidence was systematically catalogued for analysis.

Data Analysis

Data analysis employed Miles and Huberman's (1994) interactive model, comprising four cyclical phases: data collection, data reduction, data display, and conclusion drawing/verification, conducted iteratively throughout the study. Data reduction involved: (a) complete transcription of interview data, (b) identification of research-relevant data, (c) systematic coding, and (d) thematic categorization encompassing instructional planning, implementation, HOTS/TPACK integration, assessment practices, and implementation challenges (Saldaña, 2013). Data display incorporated multiple formats: institutional profiles, participant demographics (Table 1), descriptive narratives of implementation outcomes, photographic evidence (Figures 1-2), and instructional artifacts. Conclusion drawing involved iterative processes of identifying salient findings, contextual interpretation within the Independent Curriculum framework, verification through field note review and triangulation, and synthesis of final conclusions.

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Trustworthiness

Trustworthiness was established through Lincoln and Guba's (1985) criteria: credibility (methodological triangulation and prolonged engagement), transferability (thick description of research context), dependability (comprehensive process documentation and audit trail), and confirmability (systematic evidence linkage to findings).

Table 1. Interview Protocol

No.	Interview Questions
1.	How do you plan classroom instruction, including dimensions, themes, time allocation, teaching modules, learning strategies, models, and media? Please provide concrete examples of lesson plans you have created.
2.	How do you organize the sequence of learning objectives to ensure meaningful learning aligned with student needs? Explain how you monitor and ensure achievement of these objectives.
3.	How do you design learning to develop Higher Order Thinking Skills (HOTS) and integrate Technological Pedagogical Content Knowledge (TPACK) into your instruction? Provide examples of learning activities that promote HOTS and demonstrate TPACK integration.
4.	How do you evaluate learning through reflection and feedback? What indicators do you use to measure learning success, and how do you utilize feedback to improve subsequent instruction?
5.	What challenges did you encounter while preparing and implementing instruction using specific instructional models or methods? How did you address these challenges?

RESULTS AND DISCUSSIONS

1.1 Learning Planning

Interviews with the fourth-grade teacher revealed that learning planning at SDN 6 Langkai is in the adaptation phase of the newly implemented Independent Curriculum during the 2024 school year. The teacher stated, *"Because this Independent Curriculum is new this year, we are using it for Grades 1, 3, and 4. For teaching media, such as pictures or examples, we draw them on the board. Sometimes students bring their phones to search for pictures or examples online. The time allocation for Grade 4 is 35 minutes per lesson."* These findings indicate that the Independent Curriculum implementation at SDN 6 Langkai is gradual, currently being implemented in Grades 1, 3, and 4. The learning time allocation for Grade 4 is 35 minutes per lesson, which aligns with standard elementary school practices. Regarding learning media, the teacher uses conventional approaches such as drawing on the board, supplemented occasionally by technology when students use their mobile phones to search for pictures or examples online.

***Fig 1**. Interview with a Grade 4 Teacher*

Regarding teaching modules, the teacher expressed a pragmatic approach to developing learning tools. The teacher explained, *"For teaching modules, I download them from the internet rather than creating them from scratch. Some are modified to suit my teaching needs."* The teacher employs various learning models including discussions, lectures, games, and assignments. This approach indicates that the teacher adapts existing online modules rather than developing original materials, modifying them to suit classroom needs and student characteristics. This approach reflects the

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flexibility offered by the Independent Curriculum, which allows teachers to adapt existing modules rather than requiring original development (Kemendikbudristek, 2022).

Regarding instructional methods, the teacher employs varied pedagogical approaches including discussions, lectures, games, and assignments. Classroom observations revealed that the teacher combines these methods to maintain student engagement. For example, lessons typically begin with lectures to explain concepts, continue with group discussions to deepen understanding, and conclude with games or exercises to apply the knowledge. In addition to downloaded modules, the teacher utilizes modules developed by student teachers conducting teaching internships at the school. This practice demonstrates the school's collaboration with higher education institutions and resourcefulness in utilizing diverse materials to enhance instructional quality.

The findings suggest that the teacher's approach to lesson planning aligns with the pragmatic realities of curriculum implementation, where educators balance ideal curriculum expectations with available resources and time constraints. The use of multiple instructional strategies reflects an attempt to create varied learning experiences that accommodate different student learning preferences, which is consistent with principles of differentiated instruction. However, the limited integration of technology, primarily through student-initiated mobile phone use, suggests that more systematic approaches to technology integration may be needed to fully realize the potential of TPACK in the classroom.

1.2 Development of Learning Objective Flow

The fourth-grade teacher employed a resource-adaptation approach in developing the learning objective flow, consistent with the methodology used for teaching module development. This involved sourcing available materials and contextualizing them to address school-specific requirements. The teacher articulated this process: *"We take it from Google, download it, then modify it, adapting it to the needs of each school and each class."* Institutional support facilitated this approach, as the local Education Office encouraged resource adaptation rather than requiring de novo creation of materials. This policy framework aligns with the Independent Curriculum's emphasis on teacher autonomy in contextualizing pedagogical design (Ministry of Education, Culture, Research, and Technology, 2022).

Student diversity constituted a central consideration in the development process. The teacher explicitly acknowledged the need for adaptation: *"If there are children with special needs, and every school definitely has them, we adapt them accordingly."* This statement reflects awareness of inclusive pedagogy and differentiated instruction principles.

Classroom observations substantiated teachers' implementation of individualized support strategies. One teacher described the challenges of mixed-ability instruction: "Sometimes there are students who are slow to understand explanations... everyone is given the same problem and explained together, but some students take longer." She elaborated on her responsive approach, noting the necessity of proximity-based support to ensure comprehension, particularly given students' developmental stage and varying literacy levels.

Analysis of these data reveals a tension between whole-class instruction and individualized learning needs. While uniform task presentation was observed, teachers demonstrated adaptive practices including differentiated pacing, targeted proximity support, and extended assistance for students with emerging literacy skills. Observational data confirmed substantial ability variation within the fourth-grade cohort, ranging from rapid comprehension to significant struggles with foundational reading. This heterogeneity necessitates flexible instructional approaches and individualized scaffolding responsive to learners' developmental needs (Tomlinson & Moon, 2013).

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1.3 HOTS-Based Learning and TPACK Integration

Implementation of HOTS (Higher Order Thinking Skills)-based pedagogy and TPACK (Technological Pedagogical Content Knowledge) integration in fourth-grade classrooms revealed significant constraints related to technological infrastructure and access. Teacher interviews indicated selective technology deployment across subjects, with Religious Education, the Pancasila Student Profile Strengthening Project (P5), and English language instruction incorporating digital tools such as LCD projectors and mobile devices, while other subjects notably Indonesian language remained predominantly reliant on traditional resources.

Access to mobile technology proved particularly restricted. Teachers reported that Indonesian language instruction permitted mobile device use only on designated days, with textbooks serving as the primary learning resource. English language lessons presented a hybrid approach: while physical dictionaries were officially required, teachers permitted students to access parental mobile devices for vocabulary acquisition, acknowledging students' limited device ownership.

Despite technological limitations, observational data demonstrated teachers' adaptive pedagogical strategies for cultivating higher-order thinking skills. These included interrogative techniques emphasizing analysis and evaluation, problem-solving task design, and structured discussions promoting critical engagement. However, technological constraints demonstrably limited pedagogical diversity, particularly for learning activities requiring digital information access or interactive multimedia resources (Mishra & Koehler, 2006).

These findings illuminate the implementation challenges confronting Indonesian schools, particularly those in rural contexts, in achieving curriculum-mandated technology integration. While the Independent Curriculum framework explicitly advocates technology-enhanced learning (Ministry of Education, Culture, Research, and Technology, 2022), empirical evidence reveals substantial disparities between policy objectives and classroom realities. This disjuncture reflects infrastructural and resource limitations that necessitate differentiated implementation support responsive to schools' varying technological capacities (Crompton & Burke, 2018). The persistence of digital divides within educational contexts underscores the importance of developing context-appropriate pedagogical frameworks that can support higher-order thinking development independent of technological access.

1.4 Learning Evaluation, Reflection, and Feedback

Assessment practices in the fourth-grade classroom emphasized formative evaluation through targeted questioning and task-based performance indicators. Teacher interviews revealed a question-response framework for gauging comprehension, with post-lesson assignments consisting of five questions serving as the primary summative assessment tool. Analysis of evaluation outcomes demonstrated substantial performance variance, with some students completing only a fraction of assigned questions successfully. This heterogeneity corroborates earlier observational data regarding ability diversity within the student cohort.

Participation patterns revealed a complex relationship between academic ability and classroom engagement. Observational data indicated that active participation operationalized as voluntary questioning and discussion contributions characterized only a minority of students. Counterintuitively, both high-achieving students and students with special needs exhibited similar patterns of passive engagement, frequently diverting attention to peer socialization. This finding suggests that participation may be mediated by psychosocial factors including motivation, self-efficacy, and learning style preferences rather than cognitive ability alone.

In response to engagement challenges, the teacher employed multiple re-engagement strategies, including: (1) communal singing to modulate classroom affect, (2) structured icebreakers to disrupt

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monotony, (3) crossword puzzles integrating ludic elements with cognitive challenge, and (4) visual inference tasks promoting analytical thinking. These interventions proved particularly effective during afternoon instructional periods when attention typically wanes (see Figure 2). Observational evidence indicated that such strategies successfully restored student focus and enhanced participation rates.

***Fig 2**. Classroom observation documenting learning activities and student engagement patterns in Grade 4*

The pedagogical approach to evaluation and feedback reflects a holistic conception of assessment encompassing both cognitive outcomes and affective engagement. By synthesizing formal task-based evaluation with informal observational assessment, and deploying varied engagement strategies, the teacher constructs a learning environment addressing multiple dimensions of student development. This multi-modal assessment framework enables responsive pedagogy that acknowledges individual differences in learning pace, comprehension, and participation preferences while maintaining instructional momentum across diverse learner profiles.

1.5 Obstacles to Curriculum Implementation

Implementation of the Independent Curriculum at SDN 6 Langkai encountered multiple interrelated obstacles spanning student characteristics, resource availability, and technological infrastructure. These barriers illuminate broader systemic challenges in Indonesian educational reform implementation.

Student Heterogeneity and Motivational Patterns

Student diversity constituted the primary implementation barrier. Teacher interviews revealed that students with average or below-average cognitive abilities exhibited diminished learning motivation, creating disruptive cascading effects on classroom dynamics and peer concentration. Observational data corroborated these reports, documenting patterns of restlessness, off-task socialization, and avoidance behaviors that necessitated frequent teacher redirection, thereby reducing instructional time efficiency.

Group learning configurations amplified these challenges. Initial five-member groupings proved ineffective, with typically only 40% of students (two of five) engaging productively while others engaged in distracting behaviors. Teacher adaptation to dyadic learning structures with role differentiation—one student managing conceptual work, the other documentation demonstrated improved engagement and reduced disruption. This finding aligns with research on optimal group size for collaborative learning in diverse classrooms.

Resource Scarcity and Educational Equity

Policy transitions from centralized resource provision (2013 Curriculum) to market-based acquisition (Merdeka Curriculum) generated accessibility disparities. Socioeconomic variation among student

families resulted in differential textbook and worksheet (LKS) access, with some students lacking personal materials entirely.

Teacher compensatory strategies including personal resource lending, shared-book systems (one text serving 2-3 students), and selective photocopying provided temporary mitigation but introduced new complications. Shared resource systems limited independent home study opportunities, created classroom dependency, and occasionally generated interpersonal conflicts during resource allocation. More critically, differential resource access potentially exacerbated achievement stratification between economically advantaged and disadvantaged students, perpetuating educational inequity.

Digital Infrastructure Deficits

Technological infrastructure constraints represented a third critical barrier to curriculum-mandated pedagogical innovation. Despite explicit Independent Curriculum emphasis on technology integration and 21st-century competency development, empirical conditions at SDN 6 Langkai revealed substantial implementation gaps.

Technology deployment remained confined to specific subjects (Religious Education, P5 utilizing LCD projectors; English occasionally incorporating mobile devices), with most instruction, including Indonesian language, relying on conventional pedagogical approaches. This digital divide stemmed from: (1) Insufficient LCD projector inventory requiring competitive advance scheduling (2) Limited student device ownership necessitating parental device borrowing, and (3) Critically constrained internet connectivity and data accessibility. These infrastructural deficits fundamentally constrain pedagogical repertoires, particularly for learning activities requiring digital information access, interactive multimedia, or online collaboration. The disjuncture between curriculum expectations and material conditions underscores the necessity of infrastructure investment preceding or accompanying curricular reform initiatives.

Digital infrastructure deficits extend beyond instructional contexts to constrain teacher-parent communication and assignment completion systems. Attempts to distribute assignments digitally via parental devices frequently failed due to inadequate internet access, necessitating increased in-class assignment allocation rather than digitally mediated homework submission. This constraint diminishes opportunities for extended learning beyond classroom boundaries and attenuates parental engagement in children's academic development. Furthermore, technological limitations fundamentally impede optimal TPACK (Technological Pedagogical Content Knowledge) implementation (Mishra & Koehler, 2006). Technology-enhanced pedagogical strategies articulated in curricular modules remain unrealizable, requiring substitution with conventional instructional approaches that circumscribe pedagogical innovation.

1.6 Discussion

Empirical findings illuminate substantial disjunctures between the Independent Curriculum's theoretical framework and its enacted form at SDN 6 Langkai. While teachers' pragmatic adaptation of digital learning modules demonstrates alignment with curriculum-mandated flexibility (Ministry of Education, Culture, Research, and Technology, 2022), this practice simultaneously reveals tensions between policy expectations for teacher-led curriculum development and material constraints of time, capacity, and resources (Mulyasa, 2013). This gap reflects broader patterns in educational reform implementation where policy ambitions outpace systemic capacity for enactment. The constellation of obstacles encompassing motivational diversity, material resource scarcity, and technological access inequities underscores curriculum implementation complexity, suggesting that meaningful educational reform necessitates comprehensive systemic transformation extending beyond curricular documentation to encompass resource provisioning, sustained professional development infrastructure, and equitable technological access.

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Observed differentiation practices including flexible pacing and individualized scaffolding indicate teacher awareness of responsive pedagogy principles (Tomlinson & Moon, 2013). However, these adaptations remain predominantly spontaneous and context-responsive rather than systematically planned and documented. This finding suggests that while teachers possess practical differentiation knowledge, infrastructural and temporal constraints preclude formalized implementation frameworks. The constrained realization of HOTS-oriented instruction and TPACK integration corroborates established research on Indonesian educational technology challenges (Widodo & Riandi, 2013), where structural barriers particularly digital infrastructure deficits and resource scarcity fundamentally limit pedagogical innovation. These constraints represent systemic rather than individual teacher-level impediments, reflecting the material conditions that shape pedagogical possibilities in under-resourced contexts.

Evaluation practices demonstrated summative emphasis, with limited formative assessment integration. This pattern indicates incomplete transition from assessment *of* learning to assessment *for* learning paradigms, suggesting that conceptual shifts in assessment philosophy require substantial professional development and systemic support to materialize in practice. The predominance of end-of-lesson task-based evaluation, while providing teachers with outcome data, offers limited opportunities for in-process adjustment and responsive teaching that characterize formative assessment approaches. This finding aligns with broader research indicating that assessment reform represents one of the most challenging dimensions of curricular change, requiring sustained support beyond initial policy implementation (Shepard, 2000).

Notably, teacher creativity and adaptability evidenced through innovative conventional media deployment, optimized small-group configurations, and responsive differentiation demonstrate professional resilience and pedagogical commitment. These adaptive practices constitute valuable professional knowledge that warrants systematic documentation and dissemination. However, reliance on individual teacher ingenuity as the primary compensatory mechanism for systemic deficits proves unsustainable and inequitable, placing disproportionate burden on educators while generating inconsistent learning experiences across classrooms and schools. Achieving the Independent Curriculum's aspirational goals of personalized, meaningful learning requires infrastructural investment and comprehensive support systems that enable rather than constrain teacher innovation. These findings illuminate the necessity of alignment between curricular policy expectations and material implementation conditions, suggesting that reform success depends fundamentally on bridging aspiration-reality gaps through sustained, multifaceted systemic development that addresses resource equity, professional learning infrastructure, and technological access simultaneously rather than sequentially.

CONCLUSION AND SUGGESTION

This qualitative investigation examined Independent Curriculum (Kurikulum Merdeka) enactment in fourth-grade classrooms at SDN 6 Langkai, Palangka Raya, revealing implementation characterized by initial adaptation processes amid substantial systemic constraints. Teachers demonstrated pragmatic curricular appropriation through internet-sourced module adaptation, multimodal instructional deployment (discussion, direct instruction, gamification, task-based learning), and spontaneous differentiation practices. However, HOTS-oriented pedagogy and TPACK integration remained severely circumscribed by technological infrastructure deficits, while assessment practices privileged summative over formative approaches. Implementation barriers encompassed heterogeneous student motivation, inadequate textbook provisioning, digital access inequities, and teacher capacity constraints. Despite these limitations, teachers exhibited adaptive creativity in contextualizing pedagogical strategies, underscoring that curricular reform success depends fundamentally on resource availability and comprehensive systemic support infrastructure rather than policy documentation alone.

These findings generate multiple implications for policy and practice. Educational authorities should prioritize sustained professional development targeting differentiated instruction and formative assessment competencies, pursue strategic technological infrastructure investment, and establish equitable resource distribution systems ensuring universal textbook access. Teachers require support for systematic student learning profile documentation, enhanced formative assessment integration, and continued pedagogical innovation utilizing accessible instructional resources. Strengthened school-family-community partnerships constitute essential enabling conditions for comprehensive learning ecosystems. Future research employing longitudinal designs should track implementation trajectories across extended timeframes, investigate effective HOTS pedagogy adaptations for resource-constrained contexts, and examine scaling mechanisms for successful localized innovations. Such inquiry would contribute actionable knowledge toward equitable, high-quality elementary education in diverse Indonesian educational landscapes, addressing persistent gaps between reform aspirations and implementation realities that characterize educational change in developing contexts.

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