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Digital Governance for Sustainable Educational Transformation: Evaluating Merdeka Curriculum Implementation through PMO E-Instruments in Indonesia

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Abstract: This study investigates the pivotal role of Project Management Office (PMO) e-instruments in evaluating the implementation of the Merdeka Curriculum (Merdeka Curriculum) within Indonesia's Driving School 'Sekolah Penggerak' program. The research was initiated by the critical need to ensure consistency and quality in curriculum application across diverse educational contexts, aligning with Indonesia's ongoing national educational transformation. Employing a descriptive qualitative-quantitative approach, the study involved four primary schools designated as Sekolah Penggerak, with principals and teaching staff engaging in structured assessments using the PMO e-instruments. Key findings indicated moderate performance in planning and instructional execution across most participating schools, while leadership practices demonstrated notable variability. Collaborative aspects of the curriculum, particularly project-based learning and community involvement, consistently exhibited stronger outcomes. Conversely, areas such as reflection, evaluation, and student-centered learning were identified as requiring further development. The PMO e-instrument proved to be an effective diagnostic and developmental tool, empowering school leaders to make evidence-based decisions for enhancing curriculum delivery. These findings underscore the profound importance of continuous capacity-building for school leaders to fully actualize the transformative goals of the Merdeka Curriculum. The diagnostic capability of the PMO e-instrument directly facilitates data-driven decision-making, which is a core objective of integrating such digital systems into educational management. This allows for precise identification of areas needing improvement. These findings underscore the importance of continuous capacity-building for school leaders to fully actualize the goals of the Merdeka Curriculum.

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INTRODUCTION

Indonesia is currently navigating a significant transformation within its education system, a reform driven by the imperative to meet the demands of 21st-century learning. This shift necessitates that students not only acquire knowledge but also cultivate essential skills such as independence, creativity, and collaboration (Rosmiati, et.al, 2024). This national endeavor aligns with a broader global discourse on curriculum reform, which increasingly emphasizes equipping learners with competencies vital for a rapidly changing world (Gouëdard et al., 2020). A notable evolution in these reforms is a shift from traditional "top-down" policy mandates towards more inclusive, "bottom-up" approaches that recognize and empower the central role of teachers and local stakeholders in the implementation process (Gouëdard et al., 2020).

In response to these evolving educational needs, the Ministry of Education introduced the Merdeka Curriculum as a strategic policy initiative(Asep et al., 2023). This curriculum is designed to grant schools greater flexibility in tailoring learning processes to the unique needs and contexts of their students (Rosmiati, et.al, 2024). For a global audience, the 'Merdeka Curriculum' is referred to as the 'Merdeka Curriculum' throughout this paper, with the original Indonesian term provided in parentheses. Its core

philosophy is deeply rooted in the Pancasila Learner Profile, aiming to develop holistic competencies and character by fostering student-centered learning and positioning teachers as facilitators who guide students in exploring knowledge more independently (Munaf et al., 2025; Sholeh, 2022; Sunarni & Karyono, 2023). This curriculum is characterized by its simplicity, focus on competencies and character, flexibility, alignment, mutuality, and responsiveness to assessment and feedback (Sholeh, 2022).

Despite this progressive vision, its practical implementation in schools has encountered various challenges. These include uneven school readiness, limited resources, insufficient training, and significant variations in internal leadership strategies across Indonesia's diverse educational landscape (Rosmiati, et.al, 2024). Existing literature consistently highlights the critical role of school leadership, particularly principals, in mediating curriculum reform(Idris, 2017; Roesminingsih & Sumbawati, 2022; Virella & Cobb, 2022; Zuldesiah et al., 2021). Principals are instrumental in guiding teachers, fostering collaboration, and creating supportive learning environments that are conducive to innovation and continuous growth (Utami & Ramdhani, 2022).

However, a notable gap persists in current research: there is limited evidence on how school principals are systematically evaluated in the context of this new curriculum, particularly concerning the use of digital tools for monitoring and assessing their performance in leading educational transformation (Rosmiati, et.al, 2024). This absence of structured, evidence-based evaluation mechanisms impedes the effective tracking of progress and the identification of areas requiring improvement, underscoring an urgent need for data-driven evaluation tools in educational practice(Fadillah & Yusuf, 2022).

To address this critical need, the Project Management Office (PMO) e-instrument emerges as a promising digital tool. This e-instrument was designed by the Ministry of Education, Culture, Research, and Technology of the Republic of Indonesia (Kemendikbudristek) to evaluate key dimensions of curriculum implementation, encompassing planning, instructional practices, and leadership. This digital format holds the potential to foster consistent monitoring over time, enhance transparency, and promote accountability in school management(BSKAP, 2022). The image below shows the display of the PMO instrument on the Kemendikbudristek website.

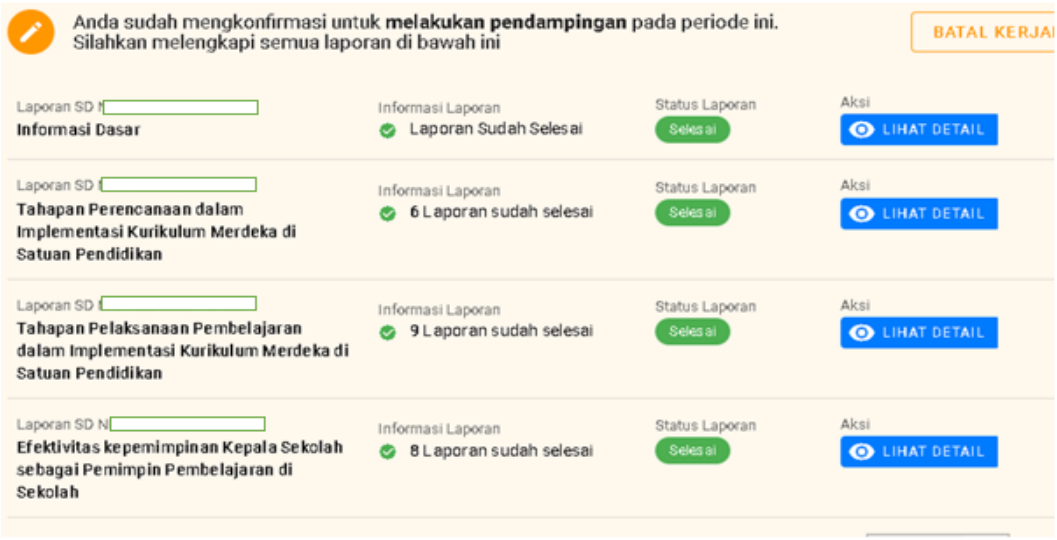

Figure 1. The Display of The PMO E-Instrument (https://app-sekolahpenggerak.simpkb.id/home)

This digital format holds the potential to foster consistent monitoring over time, enhance transparency, and promote accountability in school management (Rosmiati, et.al, 2024). This study examines the application of this e-instrument within the 'Sekolah Penggerak' program. The term 'Sekolah Penggerak' (literally 'Mobilizing School' or 'Driving School') is retained in its original Indonesian form due to its specific policy context within Indonesia's national education system (Nurasiah et al., 2022). It refers to a national school transformation program in Indonesia that holistically encourages education units to improve student learning outcomes, encompassing both cognitive and noncognitive competencies, to realize the Pancasila Student Profile (Zulfikri, 2022). This program involves five interrelated interventions,

including strengthening human resources, new learning paradigms, data-based planning, and significantly, school digitalization (BSKAP, 2022). The PMO e-instrument is thus not merely a standalone digital tool but a strategically embedded component within a large-scale, government-led educational reform effort, demonstrating how digital innovation is integrated into national policy (Zhao et al., 2016).

These disparities raise concerns about the sustainability and scalability of the curriculum implementation. Several studies indicate that school leadership plays a crucial role in mediating this process, as principals are responsible for guiding teachers, fostering collaboration, and creating a supportive learning environment (Rahmawati, 2020; Nugroho et al., 2021).

Although research has addressed the general influence of school leadership on curriculum reform, there remains a gap in how school principals are evaluated systematically in the context of this new curriculum (Cheng et al., 2025). Specifically, there is limited evidence on the use of digital tools for monitoring and evaluating the performance of principals in leading educational transformation (Corbett & Spinello, 2020; Utami & Ramdhani, 2022). The lack of structured, evidence-based evaluation mechanisms makes it difficult to track progress and identify areas of improvement. This highlights the urgency of integrating data-driven tools such as the PMO (Project Management Office) e-instrument into school evaluation practices.

The PMO e-instrument offers a promising approach to evaluate the key dimensions of curriculum implementation, including planning, instructional practices, and leadership. Through this tool, schools can reflect on their current performance, identify strengths and weaknesses, and make informed decisions for improvement. Furthermore, the digital format allows for consistent monitoring over time and promotes transparency and accountability in school management (Breiter, A., & Light, 2006). The integration of such instruments can bridge the gap between policy and practice by enabling school leaders to respond to real-time data and act on evidence rather than assumptions.

The present study aims to explore how the PMO e-instrument supports school principals in managing and evaluating the implementation of the Merdeka Curriculum in Sekolah Penggerak, specifically focusing on planning, implementation, and leadership components. The findings are expected to provide practical insights for education policymakers, school supervisors, and principal training programs, ensuring that school leaders are better equipped to lead educational innovation in dynamic and diverse learning environments. This investigation seeks to demonstrate how a practical digital tool can facilitate the translation of high-level policy visions, such as the Merdeka Curriculum, into actionable, measurable outcomes at the school level. This process is crucial for fostering evidence-based decision-making and continuous improvement, thereby bridging the gap between policy formulation and practical implementation challenges. Based on the research background that has been formulated, the following are the problem statements as below.

First, Performance evaluation, particularly school performance evaluation, is a crucial activity in Indonesian schools aimed at improving teaching quality. However, despite widespread adoption, studies indicate 'limited progress' and persistent obstacles, including a 'lack of preparedness' from both teachers and evaluators. This suggests that existing or traditional evaluation methods may be inefficient, burdensome, or ineffective, hindering desired improvements in pedagogical and professional competencies. E-instruments offer a transformative pathway to address these inefficiencies. They can streamline processes, automate data collection, and provide real-time insights. This can significantly reduce the administrative burden associated with manual evaluations, allowing educators to focus more on pedagogical improvement and professional development rather than paperwork. Beyond mere efficiency, e-instruments can enhance the effectiveness of evaluations by providing richer, more granular, and objective data. This data can inform precise professional development for teachers and principals, directly addressing areas for improvement identified in schools, such as strengthening instructional leadership. The ultimate goal is to move beyond mere compliance to genuine professional growth, improved instructional practices, and ultimately, enhanced learning outcomes for students. By offering efficient data collection, deeper analysis, and more comprehensive presentation of results, e-instruments have the potential to fundamentally shift the culture of evaluation within schools, transforming it from a burdensome, compliance-driven exercise into a continuous, data-informed process for professional development and growth. This could enable new, more effective evaluation paradigms that directly

support schools' capacity building and professional growth goals.

Second, the holistic and integrated view of data is crucial for identifying strengths, pinpointing areas needing attention, and informing timely, evidence-based interventions. Without this strategic integration, data collected by disparate e-instruments remains siloed, fragmented, and less actionable. By aggregating, analyzing, and synthesizing this data, the PMO system enables holistic institutional analysis and provides the necessary comprehensive insights for strategic decision-making. This directly supports the "planning based on institutional analysis" mandated by schools, empowering school leaders with actionable intelligence and moving school management beyond fragmented observations to a comprehensive, evidence-based understanding of overall school performance.

Third, there is an increasing demand for accountability in education, not only from internal stakeholders (e.g., school leaders, teachers) but also from external parties such as governments and communities. These external stakeholders increasingly demand transparency in the use of educational resources and the effectiveness of programs. This aligns with the PSP's broad involvement of all school activists, including parents and the surrounding community. E-instruments, by facilitating efficient data collection, deeper analysis, and more comprehensive presentation of results can provide verifiable, objective data on school performance. Features like 'detailed grading scale and ranks information' and a 'numeric foundation for all scales' ensure consistency, objectivity, and comparability in assessment data. This objective data forms the basis for transparent reporting. The ability to generate 'in-depth reports' reflecting individual student, class, and overall school performance, coupled with 'enhanced parent communication', directly contributes to accountability. Clear, data-backed reports make it easier to track progress, identify areas of non-compliance or underperformance, and hold stakeholders responsible for outcomes. This transparency builds crucial trust among parents, the community, and government bodies regarding schools' effectiveness, integrity, and responsible resource utilization, which is vital for sustained support and legitimacy. E-instruments are not merely internal management tools but critical communication and legitimation tools for external stakeholders. By providing verifiable, objective, and easily digestible data, they can bridge the information gap between a school's internal performance metrics and the external stakeholders' need for oversight and assurance. This can foster greater community engagement and potentially secure continued governmental and public investment, thereby sustaining the program's long-term impact and scalability.

METHOD

Research Design

This study adopted a descriptive qualitative quantitative approach (Creswell & Creswell, 2018) to explore how the use of PMO e-instruments contributes to improving the performance evaluation process in Sekolah Penggerak. This mixed-methods approach was specifically chosen to comprehensively capture both measurable outcomes derived from the e-instrument (quantitative data) and the rich, contextual experiences and perceptions of stakeholders (qualitative data) who engage with these digital tools. This design allows for a holistic understanding of the complex phenomenon of digital tool adoption and its impact on educational reform, enabling the triangulation of data to enhance the validity and depth of the findings (Creswell & Creswell, 2018). The approach was chosen to capture both measurable outcomes and contextual experiences from stakeholders using the digital tools. The implementation of this approach followed a sequential design, where initial quantitative data analysis informed and was further elaborated by subsequent qualitative inquiry, allowing for a deeper understanding of the observed phenomena (Johnson & Onwuegbuzie, 2004; Greene et al., 1989). This design allows for a holistic understanding of the complex phenomenon of digital tool adoption and its impact on educational reform, enabling data triangulation to enhance the validity and depth of the findings. The following is a flowchart along with the stages of the research implementation.

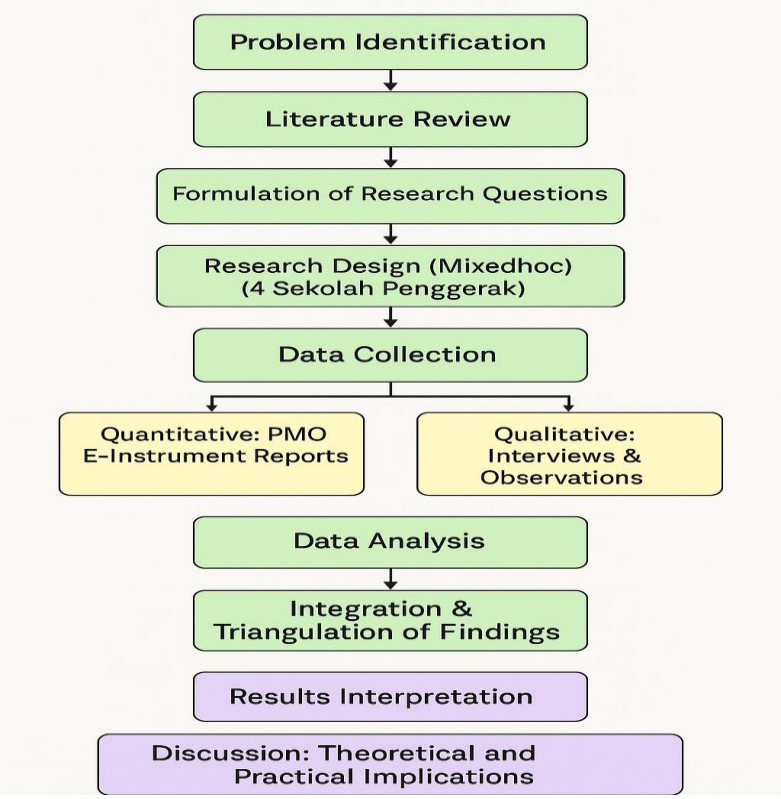

Figure 2. The Flowchart of the Research Stages

The mixed-methods design employed in this research utilizes several strategies to integrate qualitative and quantitative data, strengthening the findings and providing a more comprehensive understanding of the phenomenon (Greene et al., 1989; Johnson & Onwuegbuzie, 2004). Key strategies include:

a. Triangulation: This involves comparing qualitative findings with quantitative results to examine the level of corroboration between methodological strands, increasing validity and reducing researcher biases.
b. Complementarity: This strategy aims to enhance or elaborate on findings by balancing the strengths and weaknesses of both qualitative and quantitative approaches, leading to a more comprehensive understanding.
c. Contextualization: The qualitative data helps to contextualize the observed quantitative differences, capturing the sociocultural norms and experiential factors that characterize the educational settings.
d. Building Comprehensive Understanding: By collecting and analyzing both types of data, the study aims to build a more complete picture of the PMO e-instrument's impact on educational transformation, going beyond what a single method could achieve.

Participants and Setting

The subjects of this research are four elementary schools designated as Sekolah Penggerak in Subulussalam City, Aceh Province. The research location is limited to a single city to maintain consistency in social context, regional policies, and program implementation. These four schools were selected purposively because they had reported performance data based on the PMO, each of which had actively implemented PMO e-instruments between September 2023 and June 2024. Participants were selected through purposive sampling and included school principals, facilitators, and program coordinators involved in the planning and reporting stages. Their perspectives provided valuable insights into the practical benefits and limitations of the system.

Research Instruments

The instruments used in this study consisted of:

1. Digital PMO reports: Monthly evaluation data retrieved directly from the e-instrument system, covering sub-indicators such as KOSP (School-Based Operational Curriculum), ATP (Learning Objectives Sequences), Learning & Assessment of Teaching Materials, and P5 (Pancasila Student Profile Project).
2. Interview guides: Semi-structured question sets designed to explore users' experiences, perceptions, and suggestions regarding the e-instruments.
3. Observation checklists: Used during monitoring sessions to record real-time use of the platform and its influence on planning and decision-making.

Data Collection Procedures

Data were collected over 10 months, beginning in September 2023. Quantitative data were obtained from the digital dashboards and exported for analysis. In parallel, qualitative data were collected through in-depth interviews and informal discussions, both in person or online depending on school accessibility. All participants gave informed consent before any data were collected. These reports were prepared by each school and verified by Sekolah Penggerak facilitators and local education supervisors. Each sub-indicator was given a numerical score within a specific range (Likert scale), which was then used as the primary research data.

Data Analysis

The quantitative data were analyzed using descriptive statistics to identify trends in performance scores across time and indicators. This analysis helped highlight patterns of progress and areas requiring attention. The qualitative data, meanwhile, were processed through thematic analysis. Transcripts were read repeatedly, coded manually, and categorized into themes that reflected users' lived experiences with the system.

RESULT

Implementation of PMO E-Instruments to Improve Efficiency and Effectiveness in Evaluating Sekolah Penggerak Performance

The implementation of the e-Instrument PMO was designed as a comprehensive tool to evaluate the effectiveness of school leaders in planning, implementing, and sustaining the Merdeka Curriculum. This digital instrument enables structured monitoring of key performance areas and offers data-driven insights into how schools align their strategies with national education reform goals. The PMO supports quality assurance at the school level through consistent documentation and feedback. The evaluation focuses on three main pillars: planning, implementation, and leadership. Planning includes the development of key documents such as ATP (Annual Teaching Plan), KOSP (School Curriculum Operational Plan), and the integration of P5 (Project-Based Learning). Implementation assesses how these plans are translated into classroom practices, teaching methods, and the use of learning tools. Leadership analysis centers on how principals guide and support their teachers, create a conducive learning environment, and ensure continuous improvement.

With the e-Instrument PMO, schools, facilitators, and supervisors can monitor progress over time, identify areas for improvement, and foster accountability among educational stakeholders. It also encourages reflective practices and shared learning among school leaders. Ultimately, this tool aims to strengthen school-based management and accelerate the successful rollout of the Merdeka Curriculum across diverse educational settings. The following presents the stages of school development from month to month.

1) Evaluating School Planning to Support the Merdeka Curriculum Implementation

The PMO e-instruments were employed to monitor strategic planning across several Sekolah Penggerak in their effort to implement the Merdeka Curriculum. Planning evaluations emphasized the development of core documents such as the School Operational Curriculum (KOSP), Learning Goals Sequence (ATP), and Pancasila Student Profile Projects (P5).

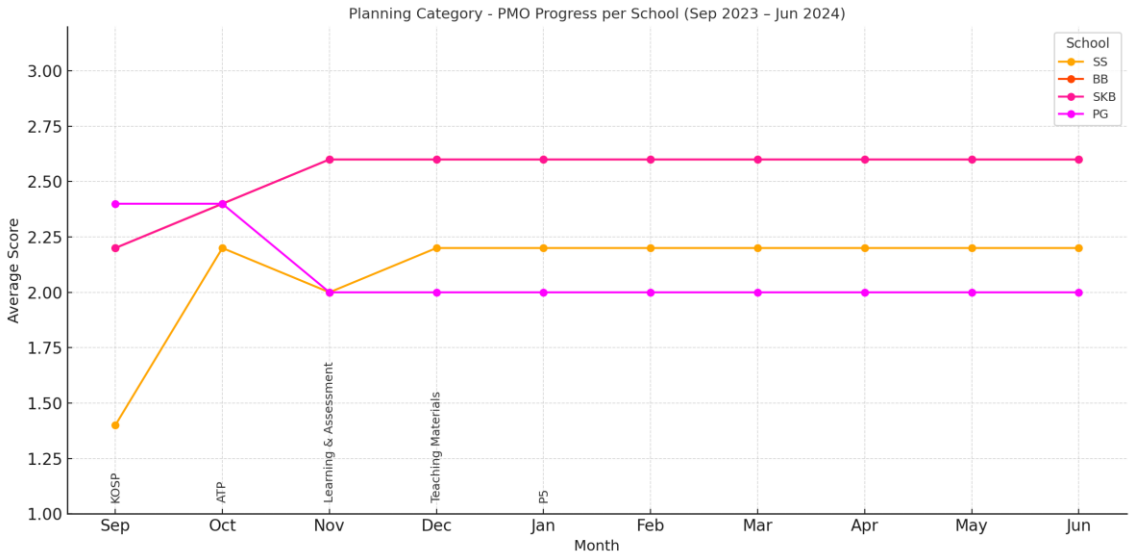

Figure 1. The Mapping of Schools' Planning Based on the PMO E-instruments

The chart presents the monthly progress of four elementary schools—SS, BB, SKB, and PG—in the Planning Category of the PMO program from September 2023 to June 2024, based on five key sub-indicators: KOSP, ATP, Learning & Assessment, Teaching Materials, and P5. From the beginning of the period, BB and SKB consistently demonstrated strong performance, reaching peak average scores of 2.6 in November and December. SS showed moderate improvement, rising from 1.4 in September to 2.2 in October, with a steady trend afterward. PG maintained a lower but stable average of around 2.0 from November onwards. Most schools performed best during the P5 phase in January, after which scores generally plateaued. The flat trend from February to June suggests that while early planning efforts were effective, sustaining that progress over time may require additional support and intervention strategies in the latter half of the academic year.

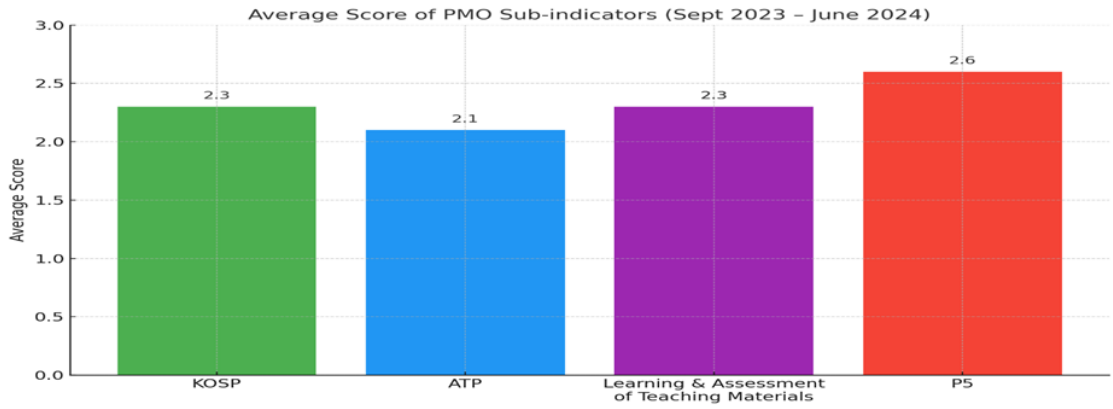

Chart 2. The Mapping of Sub-Indicator Achievement Based on PMO E-Instrument

The results indicate that the P5 component stands out with the highest average score (2.6), indicating a relatively successful implementation in that area. In contrast, ATP recorded the lowest average (2.1), potentially highlighting challenges in curriculum alignment or planning. Both KOSP and Learning & Assessment scored evenly at 2.3, reflecting a moderate level of progress. This distribution suggests that while some areas of the PMO planning framework are being adopted effectively, others still require targeted support and capacity building. Overall, the combination of temporal (monthly) and categorical (sub-indicator) data provides a well-rounded understanding of how schools engage with PMO implementation in the planning phase. It also underscores the importance of continuous monitoring and tailored interventions to support schools at different stages of progress.

2) The Use of PMO E-instruments to Support Implementation of Merdeka Curriculum

The adoption of e-instruments within the PMO framework serves as a powerful mechanism to support the implementation of the Merdeka Curriculum. Designed to streamline data collection and analysis, the e-instruments provide school leaders with real-time insights into various aspects of curriculum planning, instructional practices, and school leadership. This digital approach ensures a more transparent, accountable, and responsive system for evaluating school performance aligned with the values of educational independence and flexibility.

Through these e-instruments, schools are able to conduct comprehensive self-assessments that highlight both strengths and areas requiring improvement. The platform encourages evidence-based planning by offering structured indicators that reflect the core components of the Merdeka Curriculum, such as differentiated instruction, project-based learning (P5), and adaptive teaching strategies. This enables school principals and education stakeholders to align their strategies with national education priorities while fostering innovation and autonomy at the school level.

Moreover, the e-instruments support ongoing monitoring and evaluation that empowers schools to adjust their implementation strategies dynamically. By integrating planning, execution, and leadership evaluation into one digital tool, the PMO e-instruments promote a culture of continuous improvement. This directly contributes to the broader goals of the Merdeka Curriculum — developing holistic, independent learners and creating an inclusive, contextual, and student-centered learning environment. Below is the mapping result on the implementation of Merdeka Curriculum using the PMO instrument.

Table 2. The Mapping on the Implementation of Merdeka Curriculum Using the PMO Instrument

Subindicator	SS	BB	SKB	PG
Project-Based Learning (P5)	2	3	3	2
Student-Centered Learning	2	2	3	2
Assessment Practice	2	3	3	2
Developmentally Appropriate	2	2	2	3
Parent/Family Collaboration	3	3	3	3

The chart illustrates the implementation status of the Merdeka Curriculum across four elementary schools—SS, BB, SKB, and PG—based on multiple subindicators measured through the PMO e-instrument. Each subindicator reflects a key dimension of curriculum execution, including pedagogical approaches, student engagement, and stakeholder collaboration.

Among the sub-indicators, Project-Based Learning (P5) consistently received the highest scores, particularly at SKB and BB, both of which achieved the maximum score of 3. This suggests that these schools have successfully integrated project-based methodologies to cultivate Pancasila Student Profiles. Similarly, Student-Centered Learning and Learning Assessment scored well at SKB and BB, highlighting their focus on active learning and continuous feedback mechanisms.

In contrast, Reflection and Evaluation showed relatively lower scores across all schools, with SS and PG scoring particularly low in this area. This trend suggests a general need to strengthen reflective practices that support continuous improvement at the institutional level.

School SS demonstrated moderate to low performance in most subindicators, particularly in Teacher Collaboration and Community Engagement, indicating a potential gap in distributed leadership and external partnerships. Meanwhile, school PG showed balanced strengths, especially in Developmentally Appropriate Practices and Parent/Family Collaboration, where it scored equally with the leading schools.

Overall, the data emphasizes varied progress across institutions, where SKB and BB appear to be leading in comprehensive implementation. At the same time, SS may benefit from targeted support, especially in fostering collaboration and reflection. The findings reinforce the role of PMO e-instruments as diagnostic tools for guiding school-level planning and improvement that are aligned with the goals of the Merdeka Curriculum.

3) The Principals' Evaluation in Implementing Merdeka Curriculum through PMO Instruments

The role of school principals is pivotal in ensuring the successful implementation of the Merdeka Curriculum. Through the use of PMO instruments, principals are evaluated not only on how well they plan and organize school programs but also on how effectively they lead the entire learning ecosystem. These digital tools provide a structured way to assess leadership practices, from the development of curriculum strategies to the day-to-day guidance they offer to teachers and staff.

The evaluation focuses on three main dimensions: planning, implementation, and leadership. In the planning phase, principals are assessed on their ability to design adaptive learning programs aligned with the principles of the Merdeka Curriculum, such as student autonomy, contextual learning, and project-based activities. The implementation aspect examines how these plans are translated into classroom practices, including the use of appropriate learning tools, teacher collaboration, and the integration of assessments. Meanwhile, the leadership component explores how principals foster a school culture that supports innovation, inclusivity, and continuous professional growth.

By using PMO instruments, the evaluation process becomes more objective, measurable, and actionable. It empowers principals with meaningful feedback that they can use to reflect on their practices and refine their strategies. More importantly, it encourages a mindset of shared responsibility, where principals are not just administrators, but instructional leaders who drive transformation in their schools. In this way, PMO instruments contribute to building stronger, more responsive leadership that aligns with the spirit and goals of the Merdeka Curriculum. The chart below shows the comparison of schools based on the leadership-related sub-indicators.

Table 1. Leadership Category – PMO Sub-Indicator Scores per School

Sub-Indicator	SS	BB	SKB	PG
Leading Student-Centered Learning	4	4	3	2
Leading Reflection and Improvement	2	2	3	2
Developing a Learning Environment	4	4	4	2
Engaging Parents as Learning Partners	3	3	3	3
Professional Networking Participation	3	3	3	3
Spiritual, Moral & Emotional Maturity	4	4	4	5
Building Practitioner Community	3	3	3	2

The evaluation highlights strengths and areas for growth in various aspects of educational leadership. Leading student-centered learning is a strong suit, with high scores in most categories, especially in SS and BB, although there's room for improvement in PG. In the area of leading reflection and improvement, the scores are relatively lower, especially in SS and BB, indicating a need for more focus on personal reflection and continuous growth, though SKB shows some progress. Developing a learning environment stands out with high ratings, particularly in SS, BB, and SKB, suggesting a solid foundation in creating supportive and engaging spaces for learning, though PG could benefit from further attention. Engaging parents as learning partners shows consistent performance, with scores of 3 across all categories, reflecting a steady, if not exceptional, effort to involve parents in the learning process.

Similarly, professional networking participation maintains steady scores, suggesting ongoing engagement and room for further development. The strongest area is spiritual, moral, and emotional maturity, where the individual demonstrates a well-rounded approach, with the highest score of 5 in PG, reflecting a high level of maturity in this domain. Lastly, building a practitioner community shows balanced performance in SS, BB, and SKB but reveals a need for greater engagement in the PG category. Overall, the evaluation reflects a strong focus on student-centered learning, a nurturing learning environment, and emotional maturity, with some areas for growth in reflection, professional networking, and community building.

The Integration of E-Instruments with the PMO Information System to Support Data-Driven Decision-Making in the Management of Sekolah Penggerak

The integration of e-instruments into the PMO information system has significantly enhanced the quality of data collection and monitoring within Sekolah Penggerak. Through structured indicators such as Planning (KOSP, ATP), Teaching and Assessment, Teaching Material Development, and P5 (Project-Based Learning), the system enables consistent tracking of performance across schools. The data collected from September to December 2024 across four pilot schools reveals stable engagement with planning activities, with KOSP and ATP subindicators maintaining average scores around 2.1 to 2.3. This reflects a moderate level of preparedness in curriculum planning across the schools.

Teaching and learning implementation and the development of instructional materials showed similar consistency, with average scores also ranging between 2.3 and 2.4. These findings suggest that while schools have integrated core aspects of the Merdeka Curriculum, there remains room for improvement in aligning instructional practices with student-centered learning. Notably, BB and SKB demonstrated slightly higher ratings in "Teaching and Assessment" and "Learning Tool Development," which may indicate stronger internal support systems or leadership initiatives in these schools.

The data also highlights the relatively stronger performance in the P5 (Project-Based Learning) indicator, with an overall average of 2.6. This suggests that schools are increasingly familiar with applying project-based approaches, a key feature of the Merdeka Curriculum. This component appears to be better internalized across schools compared to the more technical aspects of curriculum planning. The consistency in P5 implementation across all four schools implies that targeted support or training in this area may have been effective.

Ultimately, the integration of the PMO e-instruments supports more precise and data-driven decision-making among school leaders. With clearly visualized performance patterns and monthly updates, principals are better equipped to identify gaps, tailor coaching efforts, and allocate resources accordingly. The availability of real-time data also promotes transparency and accountability, making it easier for stakeholders to monitor progress and set informed priorities. As such, the e-instrument serves as a monitoring tool and a catalyst for reflective leadership and continuous improvement within the Sekolah Penggerak framework.

The Impact of E-Instrument Usage on the Accountability and Transparency of Sekolah Penggerak Performance

This study aims to examine the extent to which the use of an electronic monitoring instrument (e-instrument) influences the accountability and transparency of performance within Sekolah Penggerak, focusing on three main domains: planning, implementation, and leadership. The analysis involves four elementary schools—SDN Singgersing, SDN Bakal Buah, SDN SPKB, and SDN Penanggalan—evaluated through indicators derived from the PMO e-instrument used in the context of Merdeka Curriculum implementation.

1) Planning Stage

The planning phase involves strategic curriculum development aligned with student needs, school context, and national education goals. Based on the e-instrument data, all schools exhibit moderate performance in this area. Scores across planning indicators show minimal variation, with averages hovering between 2.2 and 2.4. This consistency reflects a general adherence to basic curriculum planning requirements and highlights a lack of innovation or school-specific customization. The e-instrument, by quantifying and documenting planning activities, clarifies areas where planning falls short and helps identify where strategic improvement is necessary.

2) Implementation Stage

The implementation domain is evaluated using sub-indicators such as: (1) P5 (Project-Based Learning), (2) Student-Centered Learning, (3) Developmentally Appropriate Practices, (4) Assessment. Schools such as SKB and BB score highly on project-based and student-centered learning, indicating strong adoption of curriculum principles. In contrast, SS demonstrates consistently lower scores, suggesting that curriculum delivery may still rely on traditional, teacher-centered methods. Interestingly, all schools show a mid-range performance in assessment practices, averaging around 2.1, indicating that

although assessments are being conducted, their alignment with student learning outcomes and feedback mechanisms may still be lacking. The e-instrument plays a vital role here by standardizing the evaluation criteria and enabling transparent cross-school comparisons. Teachers and school heads can access performance dashboards, track progress in real-time, and identify which aspects of implementation require further capacity building.

3) Leadership Domain

Leadership is a crucial factor influencing both planning and implementation success. The subindicators include (1) Teacher Collaboration, (2) Parent/Family Engagement, (3) Community/Industry Partnership, and (4) Reflection and Evaluation.

SKB and PG consistently demonstrate strong leadership across all subindicators, suggesting active leadership correlates with better curriculum implementation. On the other hand, SS scores lower, particularly in teacher collaboration and community engagement—areas where leadership presence is essential.

One noteworthy finding is the uniformly low score (2) for Reflection and Evaluation across all four schools, highlighting a systemic challenge in embedding reflective practices. The e-instrument, however, ensures these gaps are not hidden. By making leadership performance indicators visible and comparable, it fosters a culture of accountability among school leaders.

The integration of the e-instrument into school evaluation has significantly enhanced both accountability and transparency in Sekolah Penggerak performance. It enables:

- Objective measurement of planning, implementation, and leadership quality;
- Real-time access to performance data for internal and external stakeholders;
- Evidence-based decision-making to support continuous improvement.

While the data suggests many schools are in the mid-phase of transformation, the clarity and visibility offered by the e-instrument provide the necessary foundation for sustainable change. Therefore, continued use of the e-instrument, accompanied by targeted support and professional development, is critical for advancing the goals of the Merdeka Curriculum and improving educational quality across schools.

DISCUSSION

This study offers nuanced observations into the real-time implementation of PMO e-instruments in Sekolah Penggerak within the context of Indonesia's Merdeka Curriculum. The findings illuminate how schools operationalize change in diverse and dynamic educational environments, moving beyond mere compliance assessment. This section delves into the theoretical development and implications of these findings by comparing and contrasting them with existing literature.

The PMO E-Instruments Improve Efficiency and Effectiveness in Evaluating Sekolah Penggerak Performance

The implementation results of the Program Management Office (PMO) e-instruments in the four elementary schools—SS, BB, SKB, and PG—highlight several trends in how the Merdeka Curriculum (Merdeka Curriculum) is being adopted in various school settings. Based on the sub-indicators assessed, schools showed relatively stronger performance in the areas of P5 (Project to Strengthen Pancasila Student Profile), Student-Centered Learning, and Community/Industry Collaboration, with average scores consistently approaching the maximum rating of 3.

The study's findings indicate that the PMO e-instrument plays a crucial role in enhancing the efficiency and effectiveness of performance evaluation within Sekolah Penggerak, particularly in planning and overall management. The consistent tracking of performance, provision of data-driven insights, and promotion of transparency and accountability observed in the results align strongly with established theoretical benefits of Project Management Offices in various organizational contexts.

PMOs are widely recognized for their ability to ensure consistent standards and methodologies, leading to improved coordination, reduced duplication of effort, and enhanced efficiency across projects (Sagala et al., 2021). The digital nature of the e-instrument in this study facilitates this standardization,

enabling structured monitoring and consistent tracking of key performance areas in educational planning and implementation(Huber & Helm, 2020). This corroborates the theoretical premise that PMOs, through their supportive and controlling functions, streamline processes and foster a common approach to management (Qi et al., 2025; Robinson et al., 2008).

Furthermore, PMOs contribute to improved resource utilization and planning by providing visibility into resource allocation and helping organizations optimize their use (Xu et al., 2022). The e-instrument's capacity to offer clearly visualized performance patterns and monthly updates, empowers school principals to identify gaps, tailor coaching efforts, and allocate resources accordingly (Wiyono, 2018). This directly reflects the PMO's function in supporting effective project management by planning for staff and resources in advance (Qutni et al., 2021). The findings suggest that the e-instrument acts as a practical tool for school leaders to achieve greater operational efficiency, a core benefit of PMO implementation (Huber & Helm, 2020).

The Findings in Relation to Merdeka Curriculum Implementation

The findings also reveal a nuanced picture regarding implementation fidelity versus selective adaptation, a critical aspect in curriculum reform theory. While Project-Based Learning (PBL) shows strong outcomes, aligning with the Merdeka Curriculum's intent, other core aspects like student-centered learning and reflection still require further development (Rosmiati et al., 2024). This suggests that while schools are successfully adopting certain prescribed, structured elements of the curriculum (a more 'top-down' implementation success), they might be struggling with broader pedagogical shifts or mindset changes (requiring more 'bottom-up' teacher agency and philosophical alignment). This selective adaptation implies that deeper transformations, such as true student-centeredness or embedding reflective practices, demand a more fundamental change in teaching philosophy and practice, which is often more challenging to achieve through policy mandates alone (Gouëdard et al., 2020). The theoretical implication is that successful curriculum reform requires not just the introduction of new components but sustained support for pedagogical shifts and mindset changes among educators, highlighting a gap between policy intent and practical enactment(Fadillah & Yusuf, 2022).

Leadership factors, particularly in terms of teacher collaboration and stakeholder engagement, played a significant role in determining the effectiveness of curriculum implementation (Miller, 2023). This finding strongly supports transformational leadership theory in educational contexts, where principals are instrumental in inspiring and empowering their school communities (Utami & Ramdhani, 2022). As Sari & Gunawan (2022) noted, effective school leadership is a key enabler for fostering teacher collaboration and innovation under new curriculum frameworks. Schools that scored highly in leadership-related sub-indicators also generally performed better overall in planning and instructional execution. This comparison reinforces the theoretical proposition that strong leadership, characterized by idealized influence, inspirational motivation, and individualized consideration, is crucial for successful educational change initiatives (Aryawan, 2019; Reave, 2005; Usman et al., 2021). The implication is that leadership development programs must focus on cultivating these specific transformational traits to ensure effective curriculum implementation and foster a culture of continuous improvement.

Conversely, the uniformly low scores in the sub-indicator 'Reflection and Evaluation' across all schools signal a critical area for improvement. This finding aligns with literature highlighting that reflective practices are often underdeveloped in Indonesian schools due to limited time for professional learning and a lack of tools to support evidence-based evaluation (Lestari et al., 2021). Theoretically, this points to a gap in the institutionalization of organizational learning and continuous improvement cycles within these schools. While the PMO e-instruments are designed to provide the necessary data for reflection, the results imply that merely providing a tool is insufficient; a deeper cultural shift and sustained capacity building are needed to foster a genuine reflective practice among educators. This highlights the theoretical challenge of translating data availability into actionable insights and systemic improvement, emphasizing the need for pedagogical and cultural support alongside technological solutions.

Moreover, the moderate scores in planning indicators such as KOSP and ATP underscore ongoing challenges in aligning school-based curriculum planning with national expectations. This resonates with arguments by Wulandari & Indriani (2020) that despite increased autonomy under the Merdeka Curriculum,

many schools still require structured support in developing contextually appropriate learning designs. The theoretical implication here is that while decentralization policies aim to empower local contexts (Nurasiah et al., 2022), they must be accompanied by robust support mechanisms to ensure quality and alignment. The PMO e-instrument, in this context, serves as a digital governance tool that can theoretically bridge this gap by guiding schools in translating broad curricular goals into actionable, context-specific plans, thereby facilitating a more coherent implementation of policy in a decentralized system (Indarta et al., 2022).

The Integration of E-Instruments with the PMO Information System to Support Data-Driven Decision-Making in the Management of Sekolah Penggerak

The study also highlights the e-instrument's impact on better reporting, transparency, and accountability (Iivari et al., 2020). This aligns with the literature emphasizing that PMOs provide regular status updates, thereby improving transparency and accountability for stakeholders (Alshaibani et al., 2024). The real-time data access facilitated by the e-instrument makes it easier for stakeholders to monitor progress and set informed priorities, reinforcing the theoretical role of PMOs in ensuring rigorous oversight and fiscal responsibility (Nordberg & Andreassen, 2020).

Crucially, the PMO e-instrument catalyzes continuous improvement and data-driven decision-making. This is a fundamental benefit of PMOs, which regularly review processes, incorporate lessons learned, and provide data for informed decisions (Breiter, A., & Light, 2006). The diagnostic capability of the e-instrument directly enables evidence-based decision-making (Ajayi & Omirin, 2007), strengthening the overall effectiveness of curriculum implementation. This demonstrates how digital tools can enhance the PMO's traditional function of fostering organizational maturity and improving project delivery capabilities (Ajayi & Omirin, 2007).

A significant theoretical implication of this study is that the digital nature of the PMO e-instrument, coupled with its integration within a national program like Sekolah Penggerak, may offer unique mechanisms to mitigate these common sustainability issues. The consistent, quantifiable data provided by the digital platform offers ongoing evidence of value, potentially fostering longer-term adoption and institutionalization compared to traditional, less quantifiable PMO models (Breiter, A., & Light, 2006). This suggests that digital innovation can enhance PMO longevity and value demonstration in public sector applications, particularly in education (Nasution & Sari, 2023). The study thus contributes to PMO theory by demonstrating its successful adaptation and value proposition in a non-traditional, public education sector, highlighting the potential of digital governance tools to enhance traditional PMO functions and drive systemic transformation(Usman et al., 2023).

The Impact of E-Instrument Usage on the Accountability and Transparency of Sekolah Penggerak Performance

The PMO e-instrument has shown potential in driving accountability and systematic monitoring across key educational domains (Bettin &Saccani, 2010). Its integration with school-based management practices promotes more data-driven decision-making and collaborative leadership. Nonetheless, consistent technical guidance and sustained professional development will be essential to ensure long-term sustainability and impact of this initiative in improving school performance under the Merdeka Curriculum.

The research indicates that Project Management Office (PMO) e-instruments play a role in enhancing the transparency and accountability of performance, which is a key concern in educational reforms (Ragnarsdóttir, 2023). This is particularly important in the context of curriculum implementation, where monitoring progress and ensuring fidelity to the intended design is essential (Belash et al., 2015). This impact is observed across planning, implementation, and leadership domains.

In the planning stage, the use of e-instruments aids in making planning activities more transparent through quantification and documentation(Usman et al., 2023). According to Breiter & Light (2006), effective information systems can support school decision-making by providing necessary data. This process clarifies areas needing improvement and facilitates the identification of strategic enhancements(Huber & Helm, 2020).

During the implementation phase, e-instruments can enhance accountability by standardizing

evaluation criteria and enabling comparisons. As Sagala et al. (2021) suggest, digital-based supervision can enhance school performance. This allows stakeholders to track progress and identify areas where support is needed (de Oliveira Matias & Coelho, 2011).

These instruments can make leadership performance indicators more visible in the leadership domain, fostering a culture of accountability among school leaders. Ariani & Prasetyo (2021) highlight the importance of digital transformation in school leadership, which aligns with the use of e-instruments for evaluation (Cheng et al., 2025).

Overall, the integration of e-instruments supports accountability and transparency by providing objective measurements and facilitating access to performance data. This aligns with broader trends in educational accountability, where data-driven decision-making is increasingly emphasized.

Research Advantages

This study presents several notable advantages. First, by employing a mixed-methods approach, it captures both the measurable outcomes provided by the PMO e-instrument and the contextual, experiential insights from school stakeholders, thereby offering a more holistic understanding of 'Merdeka' curriculum implementation. The integration of digital tools allows for real-time data tracking and supports evidence-based decision-making at the school level. Additionally, the research directly contributes to national policy goals by evaluating a government-initiated program (Sekolah Penggerak) in alignment with the Merdeka Curriculum. The contextual focus on four elementary schools in Subulussalam City adds depth to the analysis by highlighting local educational dynamics that may be overlooked in broader studies. Furthermore, the PMO e-instrument promotes reflective practices and professional growth among school leaders, particularly in fostering student-centered learning and collaborative leadership.

Research Limitations

However, the study is not without limitations. Its geographic scope is confined to a single city, which may limit the generalizability of the findings to other regions with different socio-educational contexts. The reliance on self-reported data introduces the potential for bias, as participants may overestimate performance or underreport challenges. Additionally, the ten-month data collection period may not fully capture the long-term impact of digital tool adoption or curriculum reform. Variations in digital literacy among educators and administrators could also affect the accuracy and consistency of data recorded through the PMO system. The absence of a control group further limits the ability to distinguish the specific effects of the PMO tool from other influencing factors. Lastly, although the e-instrument is designed to facilitate reflection and continuous improvement, the study reveals that many schools still struggle to translate available data into meaningful pedagogical change, highlighting a broader issue of an underdeveloped reflective culture within educational institutions.

CONCLUSION

This study offers nuanced insights into the real-time implementation of PMO e-instruments in Sekolah Penggerak within the context of the 'Merdeka' Curriculum. Rather than merely assessing compliance, the findings illuminate how schools operationalize change in diverse and dynamic educational environments. The study contributes theoretically by bridging implementation science with curriculum reform efforts in developing countries, highlighting how leadership readiness, planning coherence, and reflective practices serve as critical enablers or barriers to sustained transformation.

Practically, the PMO tool emerges not just as a monitoring device but also as a formative instrument capable of fostering school self-awareness, guiding professional development, and enabling adaptive planning. It further underscores the importance of distributed leadership and contextual responsiveness in policy enactment at the school level. In conclusion, the research underscores the necessity of embedding reflective, data-informed practices into the DNA of school reform. The ongoing refinement of PMO instruments, supported by continuous mentoring and systemic capacity-building, holds promise not only for Sekolah Penggerak but also as a scalable model for broader educational transformation.

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