

**Strengthening the Role of Local Governments in Implementing the *Merdeka* Curriculum Policy through Knowledge Management**Leli Alhapi<sup>1,2,\*</sup>, R. Yugo Kartono Isal<sup>3</sup>, Rizal Fathoni Aji<sup>4</sup>, E. Oos M. Anwas<sup>5</sup>, Ta'rif<sup>6</sup>**ARTICLE INFO****ABSTRACT****Article History:**

Received: 13 Septmeber 2024

Received in revised form: 21 December 2024

Accepted: 30 December 2024

DOI: 10.14689/ejer.2024.114.04

**Keywords**

National curriculum reform, Curriculum implementation, Soft system methodology, Local education governance

**Purpose:** The *Merdeka* curriculum introduces flexibility, teacher autonomy, and digital-based support in Indonesia's education system. However, local governments have not adequately prepared stakeholders with the necessary knowledge to implement the curriculum. Consequently, gaps in knowledge dissemination and utilization hinder effective implementation, particularly in enhancing teacher competence. This study explores systemic challenges in *Merdeka* curriculum implementation at

the local government level and proposes a Knowledge Management (KM)-based policy model to strengthen the role of local governments in curriculum execution. **Method:** Using a qualitative approach with Soft Systems Methodology (SSM), data were collected through interviews and focus group discussions with key stakeholders, including government representatives, curriculum experts, local education authorities, supervisors, principals, and teachers. Rich picture analysis visualizes systemic challenges and stakeholder interactions. **Findings:** The rich picture reveals three areas of conflicts in curriculum implementation: (1) misalignment between local authorities and schools, (2) differing curriculum interpretations between supervisors and school staff, and (3) inefficient use of digital support systems. A KM-based policy model has been developed to resolve these conflicts and enhance local governments' role in implementing the *Merdeka* curriculum. **Implication for Research and Practice:** This study recommends KM-based policies for local governments to enhance curriculum implementation. The proposed model improves knowledge sharing, addresses systemic challenges, and strengthens educational governance and practice. Future research should develop an adaptive KM framework that fits Indonesia's diverse local government conditions.

© 2024 Ani Publishing Ltd. All rights reserved.

<sup>1</sup> Faculty of Computer Science, Universitas Indonesia, Depok, 10430, IndonesiaORCID: <https://orcid.org/0000-0001-6101-6442>, Email: [leli.alhapi@ui.ac.id](mailto:leli.alhapi@ui.ac.id)<sup>2</sup> National Research and Innovation Agency, Jakarta, 10340, IndonesiaORCID: <https://orcid.org/0000-0001-6101-6442>, Email: [leli006@brin.go.id](mailto:leli006@brin.go.id)<sup>3</sup> Faculty of Computer Science, Universitas Indonesia, Depok, 10430, IndonesiaORCID: <https://orcid.org/0000-0002-9897-6962>, Email: [yugo@cs.ui.ac.id](mailto:yugo@cs.ui.ac.id)<sup>4</sup> Faculty of Computer Science, Universitas Indonesia, Depok, 10430, IndonesiaORCID: <https://orcid.org/0000-0002-9931-5728>, Email: [rizal@cs.ui.ac.id](mailto:rizal@cs.ui.ac.id)<sup>5</sup> National Research and Innovation Agency, Jakarta, 10340, IndonesiaORCID: <https://orcid.org/0000-0001-6424-0570>, Email: [ence002@brin.go.id](mailto:ence002@brin.go.id)<sup>6</sup> National Research and Innovation Agency, Jakarta, 10340, IndonesiaORCID: <https://orcid.org/0000-0001-9862-3588>, Email: [tari002@brin.go.id](mailto:tari002@brin.go.id)\*Correspondence: [leli.alhapi@ui.ac.id](mailto:leli.alhapi@ui.ac.id)

### Introduction

Indonesia's poor performance in the 2018 PISA assessment, where 15-year-old students consistently scored below the OECD average in reading, mathematics, and science, underscored a persistent learning crisis as shown [Figure 1](#). This issue was exacerbated by the COVID-19 pandemic, which forced a shift to online learning and resulted in significant learning loss ([Suyadi et al., 2023](#)). In response, the Ministry of Education, Culture, Research, and Technology (MoCRT) introduced an emergency curriculum that streamlined the 2013 curriculum, unexpectedly improving students' literacy and numeracy. To build on this progress, the *Merdeka* curriculum was implemented as a long-term strategy to enhance learning outcomes and reduce learning loss by increasing teacher autonomy, easing national standards, and promoting student agency ([Anggraini et al., 2022](#)).

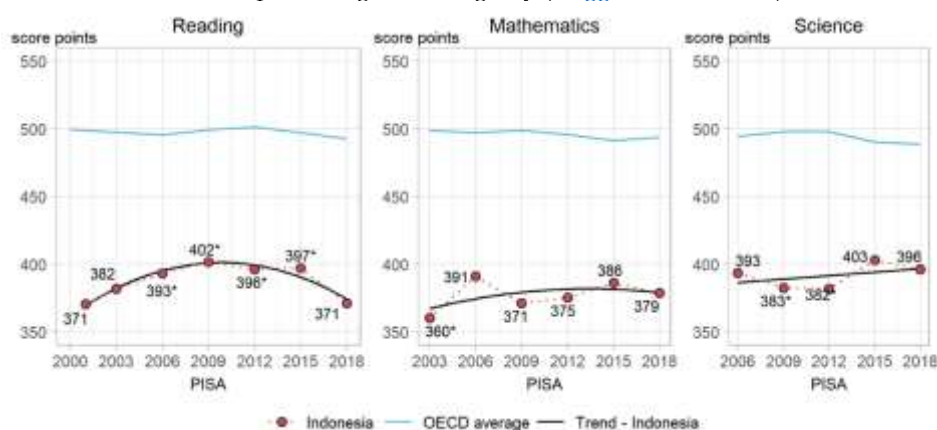


Figure 1: Indonesia's 2018 PISA performance

Digital-based support is a key component of the *Merdeka* curriculum, replacing large-scale hierarchical training, which often encounters challenges such as time constraints, geographical barriers, and high costs ([Hedar et al., 2016](#)). It is intended to align curriculum implementation with established regulations, directives, and guidelines ([Aegustinawati & Sunarya, 2023](#)).

The *Merdeka* curriculum was implemented in stages. First, through a ministry program that provides financial support and training, along with digital-based support ([Figure 2](#)). Second, through the participation of independent schools, which rely solely on digital-based support.



Figure 2: Digital-based Supports

However, limitations in infrastructure and technical expertise continue to hinder its effectiveness (Mahdum et al., 2019). Evaluation findings indicate that digital support from the central government remains insufficient, as stakeholders continue to face knowledge gaps (Warsihna et al., 2023). The persistent knowledge gap highlights the need for a more structured knowledge-sharing approach (Bagherian et al., 2022; Liu & Lee, 2013; Siuko et al., 2023) particularly at the local government level. The absence of systematic knowledge-sharing mechanisms between policymakers, local authorities, and school administrators weakens policy coherence and continuity, making it difficult to establish a unified approach to implementation (Tikkanen et al., 2020). Integrating Knowledge Management (KM) principles can help local governments systematically capture, organize, and disseminate knowledge, ensuring educators and policymakers have structured access to relevant information for more effective curriculum implementation (Grefalda et al., 2020).

Building on this perspective, this study applies KM principles through Soft System Methodology (SSM) to:

- Map out systemic challenges in the implementation of the national curriculum at the local government level using a rich picture approach.
- Identify gaps between policy design and actual implementation based on SSM analysis.
- Develop a KM-based policy model to strengthen the role of local governments in supporting curriculum implementation.

## Literature Review

### *The Role of Local Government in Curriculum Implementation*

The curriculum reform responds to emerging challenges and opportunities (Alhamuddin, 2014) with the goal of enhancing learning outcomes and supporting the teaching profession (Dewantara, 2020). To implement this reform effectively, Indonesia

follows a structured curriculum development cycle, which requires strong political support to ensure its success (Wahyudin & Suwirta, 2020). Its effectiveness depends on a well-designed implementation strategy that considers multiple factors (Larke, 2019; Manyukhina & Wyse, 2019). A balanced integration of top-down directives and bottom-up initiatives is crucial, with strong leadership in change management and structured knowledge exchange processes to ensure success (Tikkanen et al., 2020). As a “soft policy”, curriculum reform balances decentralized decision-making with system-wide coherence. Moreover, successful implementation requires clearly defined stakeholder roles, continuous professional development, and a supportive social environment (Sinnema et al., 2020).

The roles of stakeholders, especially local governments, are crucial in adapting national policies to regional needs. Rawling (2020) emphasizes that while curricula are designed centrally, their effectiveness depends on local governments translating it into practical strategies. Local governments mediate between national policies and regional needs, ensuring alignment with socio-cultural contexts and institutional capacities (Manyukhina & Wyse, 2019). Therefore, Local governments play a crucial role in supporting educators by providing guidance, resources, and professional development. Decentralized support systems, such as teacher training and curriculum workshops, enhance policy adoption and classroom execution (Cullinane & Erduran, 2023). However, despite their crucial role in supporting educators and facilitating curriculum adaptation, local governments often struggle to balance national mandates with regional educational priorities. Consequently, some regions may face difficulties in fully integrating national curriculum reforms due to inadequate capacity-building initiatives and limited access to essential pedagogical resources (Farmer, 2019). Studies indicate that financial constraints, bureaucratic inefficiencies, and inconsistent policy enforcement pose significant barriers to curriculum implementation at both the local and school levels (Sinnema et al., 2020).

A collaborative implementation strategy can address these challenges by involving local education offices, school leaders, teachers, and community representatives to ensure policy alignment and feasibility. Tikkanen et al. (2020) suggest that this collaboration fosters shared ownership of curriculum reform, reducing resistance and enhancing sustainability. This participatory approach allows local governments to shift from mere policy enforcers to facilitators of adaptive education governance (Fredriksson et al., 2020). Engaging multiple stakeholders helps bridge knowledge gaps, strengthen institutional capacities, and create a more inclusive implementation process. Collaborative strategies must also consider the operational realities of schools, as national curriculum changes impact various aspects of school management and instruction. School principals play a key role in developing school-based curricula and must interpret and implement government policies effectively to improve educational quality (Hidayat et al., 2023). Successful implementation requires adequate guidance and support from local education offices. Teachers also need retraining to align lesson plans with the *Merdeka* curriculum, ensuring structured and goal-oriented learning (Baadilla et al., 2023). By integrating professional development into a collaborative framework, local governments can help educators and school leaders adapt to curriculum changes more smoothly.

In addition to collaboration, teacher autonomy is vital for effective curriculum implementation at the school level. Cross-national research shows balancing policy

directives with teacher autonomy is challenging. For instance, in Finland and Ireland, teachers face increasing pressure from both society and government, which affects their teaching freedom (Salokangas et al., 2020). While professional development helps teachers align with national standards, their ability to adapt teaching methods to local needs is essential. However, studies suggest teachers may resist centrally developed curricula that don't fit local contexts, even when required by law (Larke, 2019). This resistance is further complicated by recent reforms, which may unintentionally reduce teachers' roles as learning facilitators, shifting teaching approaches in unexpected ways (Salokangas et al., 2020).

Strengthening teacher capacity goes beyond following new policies, it involves providing educators with the skills to manage curriculum changes effectively (Chu et al., 2021; Cushing, 2021). Adequate government financial support is also crucial to ensure schools have the necessary digital infrastructure for smooth integration of technology into teaching. Additionally, curriculum reform should encourage policymakers, school leaders, and teachers to create a culture of self-governance, where decisions are made at the school level to better address local educational needs (Daly-Smith et al., 2020).

#### *Knowledge Management in Curriculum Implementation*

Effective curriculum implementation requires not only policy changes but also systematic knowledge dissemination to ensure consistent interpretation and implementation (Fullan, 2016). Without a structured approach, gaps in knowledge interpretation and application may emerge, causing disparities in execution and leading to uneven educational outcomes (Sinnema et al., 2020). KM plays a vital role in addressing these gaps by facilitating the acquisition, sharing, and application of curriculum-related knowledge at all levels of governance (Dalkir, 2013). By enabling a shift from one-time training to continuous learning and adaptation, KM enhances curriculum implementation, particularly in decentralized education systems like Indonesia's, where regional disparities remain a challenge (Pisa, 2019). Grefalda et al. (2020) emphasizes the crucial role of local governments in ensuring effective policy implementation through systematic knowledge transfer. In the context of the *Merdeka* curriculum, local governments need to actively manage curriculum knowledge to address gaps in adoption and execution. In addition to utilizing digital platforms, KM-based strategies such as professional learning communities (PLCs), peer mentoring programs, and repositories of best practices can support continuous learning. These initiatives not only strengthen knowledge sharing among educators but also align with the *Merdeka* curriculum's goal of empowering teachers as decision-makers in the learning process (Alwi & Indriyani, 2023).

To ensure effective curriculum implementation, local governments must actively manage and disseminate knowledge through structured mechanisms. The Socialization, Externalization, Combination, and Internalization (SECI) model by Nonaka and Takeuchi (1995) provides a relevant framework for understanding this knowledge transformation process, as shown in Figure 3.

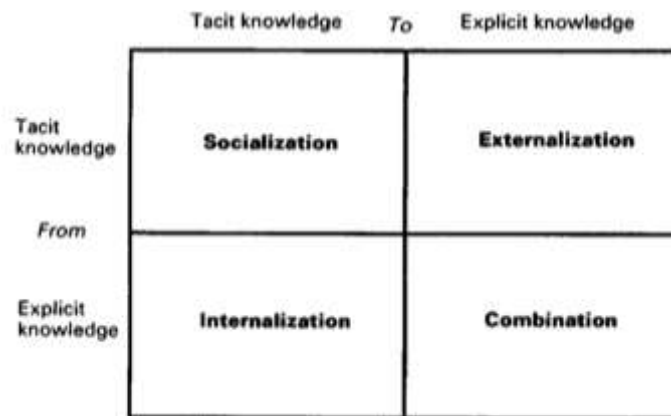


Figure 3: SECI Model

This model explains how tacit knowledge (e.g., teachers' experiences and best practices) can be converted into explicit knowledge (e.g., curriculum guidelines and training materials), and vice versa. In the context of the *Merdeka* curriculum, the SECI model can enhance local governments' role in managing curriculum knowledge and addressing disparities in implementation. In the SECI model, curriculum knowledge transforms through four phases. *Socialization* fosters peer learning and collaboration to bridge regional disparities. *Externalization* converts best practices into structured knowledge products, ensuring shared insights. *Combination* integrates diverse knowledge sources to refine curriculum resources. *Internalization* applies acquired knowledge in classrooms, reinforcing learning through practice and feedback. By embedding continuous learning, this model shifts curriculum implementation from one-time training to a sustainable adaptation cycle (Dewi & Mudrikah, 2023).

The SECI model, integrated with knowledge exchange, direction, and routines, underpins the KM process of discovering, capturing, sharing, and applying knowledge (Becerra-Fernandez & Sabherwal, 2014). This framework strengthens curriculum implementation by structuring knowledge flow, as illustrated in Figure 4. KM processes need support from infrastructure, mechanisms, and systems to achieve organizational goals, as shown in Figure 5.

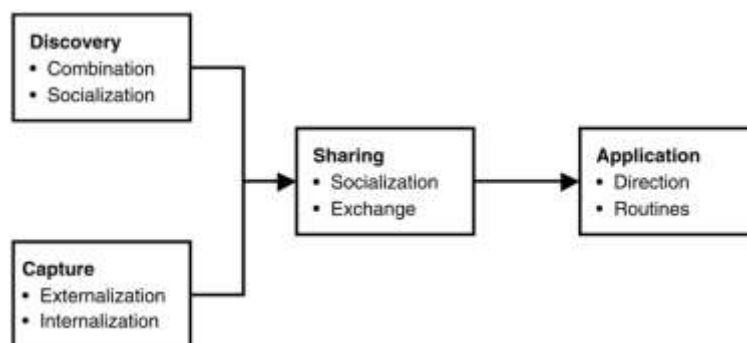


Figure 4: Knowledge management Processes

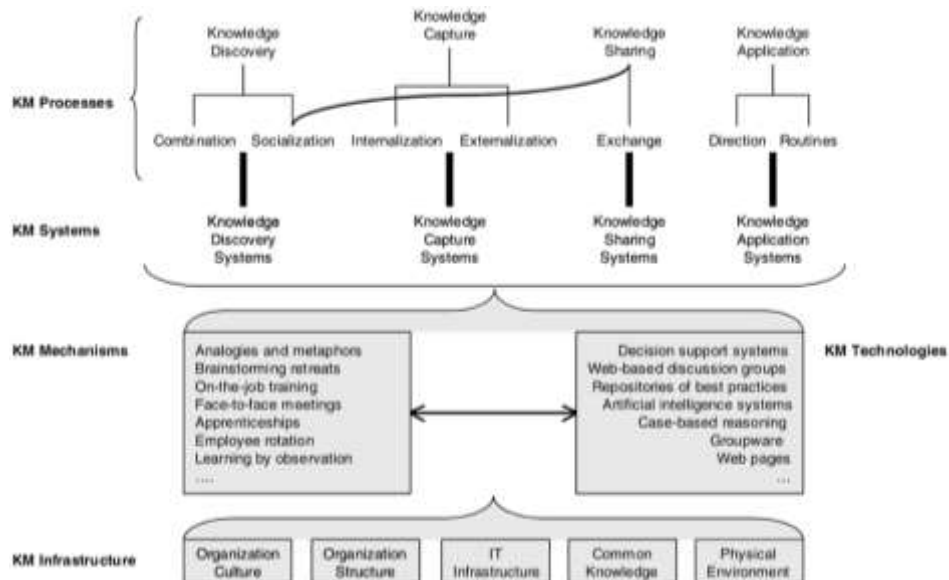


Figure 5: Knowledge management Solution

## Method

### Research Design

This study uses SSM, a structured approach to address complex social problems (Checkland & Poulter, 2007). SSM is ideal for this research because it: (1) incorporates multiple stakeholder views, (2) highlights the importance of human factors in solving problems, and (3) function as a creative and intuitive tool that prioritizes issue analysis over immediate practical solutions (Avison & Fitzgerald, 2003). SSM consists of four key stages as shown in Figure 6.

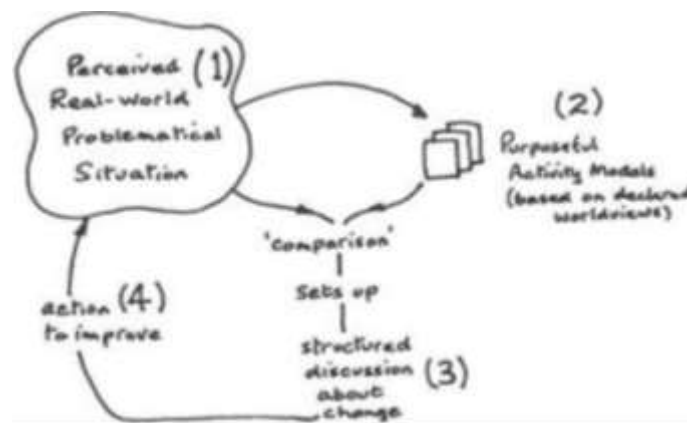


Figure 6: SSM's Learning Cycle

### Data Collection and Output

The data collection techniques and outputs from each stage are described in [Table 1](#).

**Table 1**

#### SSM Stages and Data Collection Techniques

No.	SSM Stages	Data Collection Techniques	Output
1	Perceived real-world problematical situation	<ul style="list-style-type: none"> <li>• Analysis of the regulation of the MoECRT Number 12 of 2024.</li> <li>• Interview with curriculum bureaucrats</li> <li>• FGD with:                             <ul style="list-style-type: none"> <li>• the leader of the national curriculum development team;</li> <li>• teachers' association; and</li> <li>• education observer.</li> </ul> </li> <li>• Audience with stakeholders.</li> </ul>	Rich picture
2	Purposeful activity models	<ul style="list-style-type: none"> <li>• Literature review</li> <li>• Interview with curriculum experts</li> </ul>	Root definition and conceptual model
3	Structured discussion about change	<ul style="list-style-type: none"> <li>• Interview with local education bureaucrats who responsible for managing teachers and education personnel from selected provinces, regencies, and cities</li> </ul>	Enhanced of conceptual model
4	Action to improve	Do the purposeful activity model for attaining the successful national curriculum implementation at school: to strengthen the local education office's role in managing stakeholder's knowledge.	the action needed for successful national curriculum implementation at school and recommend it to the actor and the clients or problem owners.

## Results and Discussion

### Perceived Real-World Problematical Situation

The output of this stage is a rich picture as shown in [Figure 7](#) developed from qualitative data gathered through document analysis, interview, FGD results, and responses from the audience.

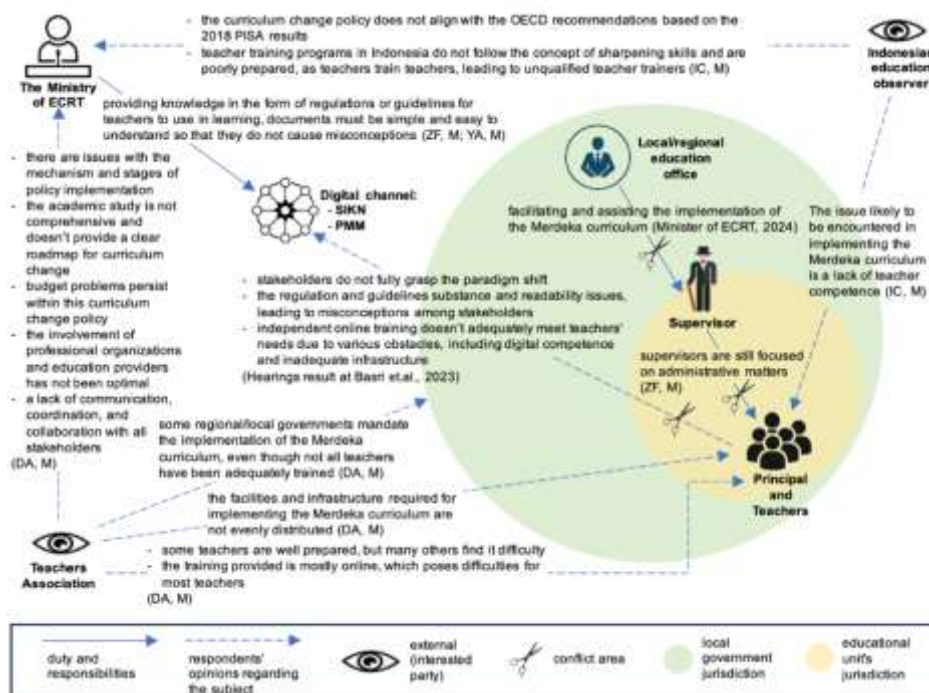


Figure 7: Rich picture

The interview was conducted with the acting head of the curriculum and learning center, while the FGD involved three expert panelists: the leader of the national curriculum development team, a representative of the teachers' association, and an education observer. Additionally, audience sessions were held in nine regencies/cities: Bandung City, Cirebon Regency, Majalengka Regency, Yogyakarta City, Gunung Kidul Regency, Semarang City, Semarang Regency, Kediri Regency, and Sampang Regency engaging relevant stakeholders, including personnel from education quality assurance center, local education offices, and educational units. These sessions aimed to gather comprehensive insights into the implementation of the *Merdeka* curriculum.

### Document analysis

The findings highlight the structured roles of key stakeholders in implementing the Merdeka curriculum, as outlined in Ministerial Regulation Number 12 of 2024. The central government ensures policy consistency, training, and evaluation, while local governments adapt the curriculum to regional contexts, and educational units make localized adjustments. This decentralized approach fosters flexibility and collaboration but also presents challenges, such as coordination gaps between central and local governments and disparities in local capacity. Effective monitoring and evaluation are essential to addressing these issues. These findings serve as a foundation for further analysis, particularly in bridging the knowledge gap between policymakers and practitioners to improve implementation efficiency.

#### *Interview with curriculum bureaucrats*

The findings reveal a persistent knowledge gap in Merdeka curriculum implementation despite policy efforts to address it. To bridge this gap, the central government has simplified curriculum documents and strengthened knowledge transfer, yet challenges remain at the local level. Many local stakeholders, including government agencies and educational institutions, struggle to fully understand the curriculum, causing implementation misalignment. Although multiple communication channels are available, their effective utilization remains an issue, highlighting the need for a more accessible and efficient knowledge dissemination system.

#### *FGD with the leader of the national curriculum development team*

The FGD findings indicate that the Merdeka curriculum aligns with Indonesia's educational vision of fostering an Advanced Indonesia through the development of *Pancasila* Students, who embody six key attributes: faith, independence, critical thinking, creativity, collaboration, and appreciation for diversity. The *Merdeka Belajar* policy aims to ensure equitable, high-quality education by emphasizing fundamental competencies and character development, with targeted support for marginalized groups. The curriculum is built on three core elements: a focus on essential materials, project-based learning to strengthen the *Pancasila* Student Profile, and flexible learning paths tailored to students' needs. Regulations are continuously refined based on public feedback, and the central government facilitates implementation through resources such as the PMM learning platform.

#### *FGD with teachers' associations representative*

The FGD examined teachers' perspectives on the *Merdeka* curriculum, highlighting challenges in implementation, policy mechanisms, and financial constraints. The reform lacks a comprehensive academic foundation and a structured roadmap, making adaptation difficult for many educators. Online training, inadequate infrastructure, and disparities in school readiness further hinder implementation, especially in areas with limited internet access. Additionally, some local governments are required to implement the curriculum despite insufficient teacher preparation, creating difficulties in schools. Weak coordination among stakeholders and the limited involvement of professional organizations further complicated the process. Addressing these challenges requires a more structured policy framework, increased teacher support, and stronger collaboration within the education sector.

#### *FGD with education observers*

The FGD underscored a fundamental misalignment between Indonesia's curriculum reform policies and the OECD recommendations derived from the 2018 PISA results (OECD, 2019). While the OECD advocates for sustained mentoring programs to enhance pedagogical quality, Indonesia predominantly employs a peer-training model, which often results in ineffective knowledge transmission. Moreover, curriculum reforms are largely perceived as administrative adjustments rather than substantive transformations, with stakeholder responses ranging from early adopters (2.5%) to skeptics who entirely reject

change (16%). This distribution presents a significant challenge in aligning national education policies with international benchmarks and improving Indonesia's PISA performance. The resource person analogized education to healthcare, emphasizing that effective reform necessitates a direct focus on enhancing teacher competence rather than solely modifying curricular structures. Without a comprehensive strategy to strengthen teacher capacity, the intended outcomes of the *Merdeka* curriculum may not be optimally realized.

#### *Audience with stakeholders*

The audience sessions identified key challenges in the implementation of the *Merdeka* curriculum, focusing on its paradigm, learning and assessment, operational curriculum, and the *Pancasila* student profile project. Findings indicate that stakeholders struggle to fully grasp the curriculum's paradigm shift, leading to inconsistencies in application. Additionally, regulatory documents are complex and difficult to interpret, contributing to misconceptions among educators and policymakers. Furthermore, the reliance on independent online training fails to address teachers' diverse needs due to disparities in digital literacy and infrastructure, hindering effective professional development and exacerbating gaps in curriculum implementation quality.

The rich picture analysis identifies three key conflict areas hindering the effective implementation of the *Merdeka* curriculum, stemming from differences in understanding, authority, and system accessibility among local stakeholders. The first conflict occurs between the education office and educational units. While the education office is responsible for guiding and supporting educational units, it often fails to disseminate new policies or align its actions accordingly when central-level changes are introduced. This misalignment disrupts the support system and creates barriers to curriculum implementation.

The second conflict arises between education supervisors, school principals, and teachers due to differing interpretations of the *Merdeka* curriculum, leading to ineffective strategies. Many supervisors focus more on administrative compliance than on improving teaching methods. The third conflict involves tensions between school principals, teachers, and the central government's digital platforms (PMM and SIKN). While intended to support educators, these platforms do not fully address the needs of teachers and principals, particularly in regions with limited digital infrastructure and varying levels of digital literacy.

All three conflict areas fall under the jurisdiction of local governments. Consequently, strengthening the role of local governments is imperative, as the success of the *Merdeka* curriculum largely depends on its execution at the regional and school levels. To address these conflicts, a system-level solution is required to mitigate misconceptions and bridge the knowledge gap between central and local stakeholders. Strengthening local government support, improving communication channels, and ensuring a more inclusive digital infrastructure will be crucial in enhancing the overall effectiveness of the *Merdeka* curriculum.

### *Purposeful Activity Model*

This stage develops the purposeful activity model using data from literature studies and expert interviews. The literature review provides theoretical insights into curriculum implementation, while expert interviews offer practical perspectives on the challenges and opportunities of implementing the *Merdeka* curriculum. The three experts interviewed specialize in both general and vocational curriculum development. The development of the Purposeful Activity Model follows a structured process consisting of the following steps:

#### *Applying the PQR Formula*

The formula (*doing P, with Q, in order to contribute to achieving R*) is used to answer key questions: *What will the system do? How will it be done? And why is it necessary?* The responses to these questions serve as the foundation for formulating a *Root Definition*.

**P:** Preparing the region to implement the *Merdeka* curriculum.

**Q:** By defining and strengthening the role of local governments in the local stakeholder's knowledge management.

**R: Contribute** to bridge the knowledge gap among stakeholders and ensure the implementation of the *Merdeka* curriculum aligns with the regulations and guidelines developed by the central government.

The expert interviews highlight the potential of digital platforms in disseminating curriculum frameworks, guidelines, and teacher competency programs. However, the effectiveness of these platforms depends on structured follow-up at the regional level, ensuring that information is not merely supplied but also processed into meaningful application. Successful follow-up requires prerequisite understanding, which must be reinforced through guidance, mentoring, and in-house training (IHT), as comprehension alone does not guarantee implementation. Despite the advantages of digitalization, significant disparities remain, particularly in remote areas, where only a fraction of teachers can fully utilize these resources. Even in urban settings, teacher engagement is inconsistent, as demonstrated by data showing that although a high percentage of educator's access learning platforms, only a small proportion actively engage in follow-up actions. Clear participation criteria and intervention strategies are necessary to strengthen teacher responsiveness and optimize the use of digital platforms in supporting curriculum implementation.

#### *Formulating the Root Definition*

Using the insights from the PQR formula, a *Root Definition* is developed to articulate the fundamental purpose of the system.

*A local government-owned system staffed by education bureaucrats, which, in the local government context, via knowledge management of local stakeholders, prepares the region to implement the Merdeka curriculum by defining and strengthening the role of local governments in order to contribute to bridging the knowledge gap among stakeholders and ensure the implementation of the Merdeka curriculum aligns with the regulations and guidelines developed by the central government.*

### Conducting CATWOE and E<sub>1</sub>, E<sub>2</sub>, E<sub>3</sub> Analysis

After formulating the Root Definition using the PQR approach, a CATWOE analysis is conducted to refine the problem and examine stakeholders in the *Merdeka* curriculum implementation. Furthermore, the system's overall performance is assessed through three interconnected dimensions: efficacy (E<sub>1</sub>), efficiency (E<sub>2</sub>), and effectiveness (E<sub>3</sub>). The results of the CATWOE analysis and the evaluation of E<sub>1</sub>, E<sub>2</sub>, and E<sub>3</sub> are presented in Table 2.

**Table 2**

CATWOE and E<sub>1</sub>, E<sub>2</sub>, E<sub>3</sub> Result

Code	Description
C Customer	Teachers, principals, and education unit supervisors
A Actor	Education bureaucrats in the local government have the authority to manage the field of education such as the head of the Education Office and structural officials under him
T Transformation	The process of transforming the stakeholders with some knowledge gap ( <i>before</i> ) become the stakeholders without any knowledge gap ( <i>after</i> )
W Worldview	Strengthening the role of local governments through a knowledge management system implemented in local government policy which includes managing the knowledge of teachers and principals in the education unit and also the knowledge of leaders and staff of the education office, including supervisors. The management of this knowledge should also include academics from teacher-training universities.
O Owner	Local governments
E Environment	Regulation, human resources, infrastructure, supporting technology, differences in stakeholders' needs, differences in stakeholders' competency levels, and differences in stakeholders' digital abilities
E <sub>1</sub> Efficacy	The system can enhance stakeholder understanding of regulations and guidelines developed by the central government (demonstrated through a knowledge management system that supports at least the processes of knowledge discovery, capture, sharing, and application)
E <sub>2</sub> Efficiency	The minimum resources used in the transformation process (judgment by calculate the cost and manpower)
E <sub>3</sub> Effectiveness	Stakeholders understand the regulations and guidelines developed by the central government (judgment by conducting knowledge tests and observations during learning)

This study applies CATWOE analysis to identify key transformation processes and stakeholder responsibilities in addressing knowledge gaps in curriculum implementation. First, it examines two main elements: Transformation (T) and Worldview (W). T involves equipping stakeholders with essential knowledge to enhance curriculum implementation, while W emphasizes strengthening local governments' roles through a structured knowledge management system. Expert insights highlight the importance of effective school leadership, as principals must first understand the curriculum to guide and motivate teachers. Additionally, local governments play a crucial role in sustaining curriculum implementation by fostering innovation beyond central government policies.

Establishing a systematic knowledge dissemination process among teachers, principals, education offices, and academic institutions ensures the effective application of knowledge, ultimately supporting long-term educational success.

Following the identification of **T** and **W**, the next step is defining the Actors (**A**) responsible for executing the transformation process. These actors, primarily local government education bureaucrats such as the Head of the Education Office and other structural officials, oversee and regulate educational policies at the regional level. Their role is essential in implementing the *Merdeka* curriculum effectively. Expert insights highlight the importance of strong local government involvement, emphasizing that education bureaucrats must have both curriculum knowledge and digital service skills to manage the system efficiently. Without an understanding of digital infrastructure, curriculum implementation becomes more challenging. Experts also stress the need to appoint the right personnel within the education office to oversee curriculum-related knowledge. While involving high-ranking officials, such as the Head of the Education Office, is a positive step, their lack of awareness of ongoing regional activities can hinder policy execution. Strengthening the capacity of local education bureaucrats is therefore key to ensuring the successful and sustainable implementation of the *Merdeka* curriculum.

After defining **A**, it is crucial to identify the Customers (**C**), who are directly affected by these activities. In the context of the *Merdeka* curriculum, these include teachers, principals, and education unit supervisors, who experience both the benefits and challenges of its implementation. Additionally, the local government (**O**) plays a decisive role in either facilitating or hindering the transformation through policy enforcement and resource allocation. However, the process is also shaped by environmental constraints (**E**), such as regulatory frameworks, human resources, infrastructure, technology, and disparities in stakeholders' needs, competencies, and digital literacy. These factors collectively influence the effectiveness and sustainability of curriculum implementation.

The assessment of **E**<sub>1</sub>, **E**<sub>2</sub>, and **E**<sub>3</sub> is conducted based on specific evaluation criteria. **E**<sub>1</sub> focuses on how well the knowledge management system supports knowledge discovery, capture, sharing, and application. **E**<sub>2</sub> examines the financial costs and human resources required for the transformation process, ensuring that resources are utilized optimally. Meanwhile, **E**<sub>3</sub> measures stakeholders' understanding of government regulations by analyzing their performance in knowledge tests and observational studies. These three dimensions collectively provide a comprehensive evaluation of the curriculum implementation process.

### *Classifying the Model Type*

The model is evaluated to determine whether it represents a Primary Task (**PT**) within a specific organizational unit or an Issue-Based (**IB**) approach involving multiple organizational elements. The implementation of the *Merdeka* curriculum is a large-scale policy initiative managed by local governments, particularly the education offices overseeing various education units. Given this structure, the Root Definition and Conceptual Model are classified as Issue-Based (**IB**), as their implementation involves multiple divisions within the education office.

Constructing the Purposeful Activity Model –

A structured Purposeful Activity Model is developed as a conceptual framework to address the identified problem. This model integrates Root Definition, CATWOE analysis, evaluation criteria (E<sub>1</sub>, E<sub>2</sub>, E<sub>3</sub>), and model classification (PT/IB) to define the system that supports the transformation process. The development begins by identifying core activities derived from the transformation process (T), as illustrated in Sections 5, 6, and 7 of Figure 8. The model primarily aims to define and strengthen the role of regional and local governments in implementing the *Merdeka* curriculum. Given its emphasis on knowledge management, stakeholder knowledge must be systematically organized to support these activities. Therefore, the three core activities within this model are structured around stakeholder knowledge management to ensure effective curriculum implementation.

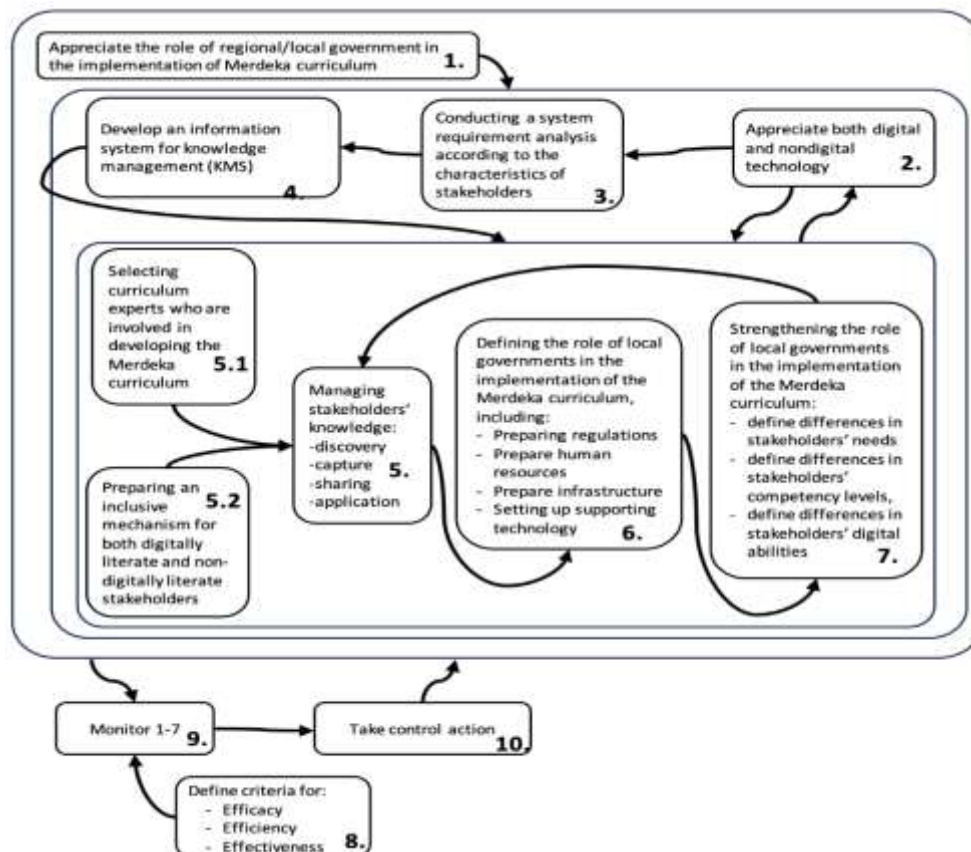


Figure 8: Purposeful Activity Model

Structured Discussion About Change

At this stage, after establishing the relevant model, a structured discussion is conducted to analyze the situation and identify potential improvements, ultimately leading to

actionable steps. The model serves as a systematic tool to guide discussions rather than relying on arbitrary analysis (Checkland & Poulter, 2007). To validate its relevance, the conceptual model from the previous stage is evaluated by comparing its components with the problem situation identified in Stage 1. This validation process involves four respondents—bureaucrats responsible for managing teachers and education personnel at the regional level. These respondents represent four local government education offices: the Jakarta Special Capital Region Provincial Education Office, the Yogyakarta Special Region Provincial Education Office, the Majalengka Regency Education Office, and the Cirebon City Education Office.

To further validate the model, a series of questions were designed to explore respondents' real-life experiences, focusing on their knowledge, perceptions, and strategic actions in implementing the *Merdeka* curriculum. These questions addressed key aspects such as stakeholders' understanding of the curriculum, the role of the education office, existing regulations, implementation strategies, resource readiness, infrastructure support, digital and non-digital learning platforms, external collaborations, and knowledge management systems. The responses were then categorized based on the activities outlined in the model, ensuring alignment between theoretical insights and practical implementation. The findings are systematically presented in a matrix format, as shown in Table 3.

Several activities in the model remain unimplemented due to the absence of a structured knowledge management system within the Education Office. Interviews with bureaucrats responsible for teachers and education personnel confirm that such a system does not yet exist. Although no concrete actions have been taken, they recognize the importance of establishing this system for stakeholders, indicating an awareness of its potential benefits. Effective knowledge management requires initial steps, such as strengthening the role of regional and local governments in assessing stakeholder needs, defining competency levels, and evaluating digital capacities. Additionally, selecting qualified resource persons, particularly those involved in the development of the *Merdeka* curriculum at the national level, is essential to ensure consistent stakeholder understanding. However, interview findings reveal that these steps have not yet been implemented by the Education Office. The discussion on feasible and desirable changes builds on the findings from interviews and theoretical reviews.

**Table 3***Interview Result*

Activities from the model	Does it exist in the real situation?	Who does it?	How?	When?	Summary comments
1. Appreciate the role of regional/local government in the implementation of <i>Merdeka</i> curriculum	Yes	Education office personnel	Perform organizational tasks and functions	When the <i>Merdeka</i> curriculum is enforced	Regional and local governments, through their education offices, support the <i>Merdeka</i> curriculum by conducting socialization, training, resource facilitation, supervision, and evaluation. They collaborate with MoECRT, allocate budgets, and enhance teacher competence to ensure successful implementation, improve education quality, and create a student-centered learning environment.
2. Appreciate both digital and nondigital technology	Yes	Education office personnel	Developing an Information system dan offline activities for teachers	Periodically	The provincial education office has a technology center for developing teacher-support applications, while district and city offices do not use digital tools but encourage teachers to use PMM.
3. Conducting a system requirement analysis according to the characteristics of stakeholders	No	-	-	-	The education office has never analyzed system needs based on stakeholders' characteristics.
4. Develop an information system for knowledge management (KMS)	No	-	-	-	The education office has never developed an information system for knowledge management (KMS).

Activities from the model	Does it exist in the real situation?	Who does it?	How?	When?	Summary comments
5.1 Selecting curriculum experts who are involved in developing the <i>Merdeka</i> curriculum	No	-	-	-	There is a lack of experts in Education office who could develop the central curriculum. Digital platforms (PMM/SIKN) and information from employees who attended MoECRT activities, are relied upon.
5.2 Preparing an inclusive mechanism for both digitally literate and non-digitally literate stakeholders	No	-	-	-	There is also lack of a specific mechanism for managing the <i>Merdeka</i> curriculum implementation, resulting in a sporadic approach. The Education Office mainly depends on external experts who are skilled in delivering the <i>Merdeka</i> curriculum.
6. Managing stakeholder' knowledge: -discovery -capture -sharing -application	No	-	-	-	The Education Office lacks organized knowledge management system for implementing the national curriculum. Competency development and curriculum implementation remain disjointed, with knowledge being integrated sporadically. The process depends on ICT specialists but lacks a cohesive and systematic framework.
7. Defining the role of local governments in the implementation of the <i>Merdeka</i> curriculum, including: -Preparing regulations	Yes	Education office personnel	Issuing some Decree to support the implementation of the <i>Merdeka</i> curriculum	When the <i>Merdeka</i> curriculum is enforced	In response to the policy of implementing the <i>Merdeka</i> curriculum, each region issues a decree that supports the central policy

Activities from the model	Does it exist in the real situation?	Who does it?	How?	When?	Summary comments
- Prepare human resources - Prepare infrastructure - Setting up supporting technology	Yes	Education office personnel	Checking the condition of each educational unit	Periodically	The Education Office faces challenges in implementing the <i>Merdeka</i> curriculum due to limited understanding and insufficient knowledge dissemination, particularly in schools that have not received comprehensive training. The central government provides support through coordination and training programs, but there remains generational disparities in comprehension and shortage of qualified personnel, which hinder effective implementation. In terms of infrastructure and technology, overall provisions are adequate, with budget allocations ensuring the necessary resources for educational institutions. Internet connectivity issues or similar challenges can be mitigated through strategic coordination and collaboration with relevant stakeholders.
8. Strengthening the role of local governments in the implementation of the <i>Merdeka</i> curriculum: - define differences in stakeholder' needs - define differences in stakeholder' competency levels,	No	-	-	-	The education office has generally not mapped the differences in the needs of each teacher, principal, and supervisor. The Education Office generally has not considered the difference in the level of knowledge/competence of each teacher, principal, and supervisor The Education Office generally has not considered the level of digital skills of each teacher, principal, and

Activities from the model	Does it exist in the real situation?	Who does it?	How?	When?	Summary comments
- define differences in stakeholder' digital abilities					supervisor, but it is working to enhance their digital competencies.
9. Define criteria for:	No	-	-	-	No actions have been taken yet
- Efficacy					
- Efficiency					
- Effectiveness					
10. Monitor	No	-	-	-	No actions have been taken yet
11. Take control action	No	-	-	-	No actions have been taken yet

Action to Improve

This stage is called the implication stage, where the focus is on identifying practical actions to solve the problem and areas that need more study. The result of this stage is shown in Figure 9.

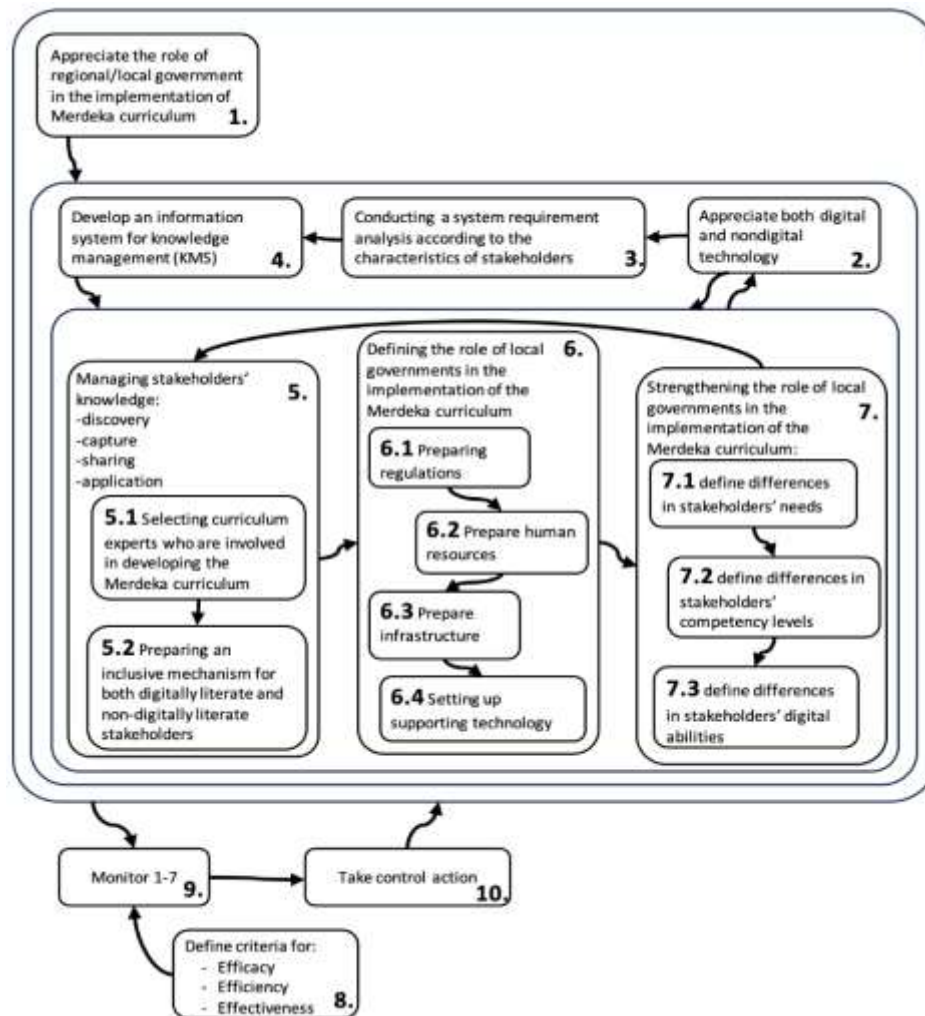


Figure 9: A KM-based policy model

The goal of this stage is to implement the proposed solutions while staying close to real-world conditions. This stage builds on earlier discussions to ensure the actions are realistic and feasible. To find effective solutions, the authors use supporting theories and expert input. The previous stage showed that many planned activities have not been implemented yet, but stakeholders in the education office agree on the importance of these activities,

especially the need for a knowledge management system, recognizing its potential to improve education processes and outcomes. The local government has recognized its role and the importance of technology in supporting Activities 1 and 2. It has also defined its responsibilities in creating regulations, preparing human resources, building infrastructure, and implementing technology as outlined in Activity 6. However, it has not yet addressed key aspects of Activity 7, such as understanding the different needs, competencies, and digital skills of stakeholders, which are crucial for effective knowledge management. Additionally, Activity 5 has not been carried out, even though it is important for successfully adopting a knowledge management system. This includes selecting curriculum experts for the *Merdeka* Curriculum and creating an inclusive system for both digitally literate and non-literate stakeholders.

To ensure successful implementation, the education office assesses both the feasibility and benefits of each action, considering stakeholder readiness and resource availability. Feasibility is based on available resources and stakeholder preparedness, while the benefits are measured by the potential improvement in knowledge management efficiency. A monitoring system is put in place to track progress and adjust actions based on stakeholder needs and technological advancements. Since success depends on collaboration among various parties, the education office aims to align local government initiatives with national education policies.

However, challenges such as resistance to change and digital literacy gaps may hinder implementation. To address these, the education office proposes targeted training and clear communication to better prepare and engage stakeholders. These actions align with the conceptual model by addressing existing gaps and following the steps outlined in the CATWOE analysis. Through these strategies, the education office seeks to connect theory with practice, ensuring more effective and sustainable knowledge management.

### Conclusion and Future Work

This study highlights significant systemic challenges faced by local governments in implementing the *Merdeka* curriculum, including limited coordination with central authorities, disparities in digital and human resources, and insufficient monitoring and evaluation mechanisms. While the local government has undertaken essential roles such as socialization, training, and infrastructure preparation, there remain critical gaps in defining stakeholder needs, competencies, and digital capabilities. These gaps hinder the effectiveness of knowledge management processes and the successful implementation of the curriculum.

A KM-based policy model for *Merdeka* curriculum implementation is proposed to address these challenges by facilitating the systematic collection, sharing, and application of knowledge. This model emphasizes the importance of identifying and accommodating stakeholder differences, ensuring knowledge consistency through expert engagement, and adopting inclusive mechanisms for diverse digital capabilities. By bridging the gap between policy design and practical implementation, the KM-based approach enhances the capacity of local governments to implement educational policies effectively.

Future research should focus on creating flexible knowledge management frameworks that meet the different needs of local governments in Indonesia. Long-term studies are

needed to assess the impact of KM-based policy models on curriculum implementation in various regions. Comparative research can help identify best practices and challenges in adapting KM practices across local governments.

### Acknowledgment

This research is partially supported by an internal publication grant from the Faculty of Computer Science, Universitas Indonesia.

### References

- Aegustinawati, A., & Sunarya, Y. (2023). Analysis of the Implementation of the *Merdeka* Curriculum in Addressing Grade Retention in Senior High Schools. *Jurnal Paedagogy*, 10(3), 759-759. <https://doi.org/10.33394/jp.v10i3.7568>
- Alhamuddin, A. (2014). History of Curriculum in Indonesia (Analysis Study of Curriculum Development Policy). *Nur El-Islam*, 1(2), 48-58. <https://media.neliti.com/media/publications/226468-sejarah-kurikulum-di-indonesia-studi-ana-bac69203.pdf>
- Alwi, R., & Indriyani, R. (2023). Analysis of the Implementation of the *Merdeka* Belajar Curriculum Program as a Strategy for Improving Education Quality. *Al-Mubin: Islamic Scientific Journal*, 6(1), 67-73. <https://doi.org/10.51192/almubin.v6i01.491>
- Anggraini, D. L., Marsela, Y., Siti, N., & Anjani Putri Belawati, P. (2022). The role of teachers in developing an independent curriculum. *Jurnal Ilmu Pendidikan dan Sosial*, 1(3), 290-298. <https://doi.org/10.58540/jipsi.v1i3.53>
- Avison, D., & Fitzgerald, G. (2003). *Information systems development: methodologies, techniques and tools* (3rd ed.). McGraw Hill. <http://eprints.soton.ac.uk/id/eprint/35879>
- Baadilla, I., Qura, U., Ibrahim, N., Sulistyawati, R., & Hidayatullah, A. (2023). Teachers' Ability to Use Lesson Plans and Its Relationship with Learning Implementation Based on the *Merdeka* Curriculum. *Imajeri: Jurnal Pendidikan Bahasa dan Sastra Indonesia*, 5(2), 184-192. <https://doi.org/10.22236/imajeri.v5i2.11148>
- Bagherian, A., Gershon, M., & Swarnakar, V. (2022). Analysis of knowledge management dimensions contributing to successful implementation of Six Sigma: an empirical study. *International Journal of Knowledge Management Studies*, 13(4), 445-477. <https://doi.org/10.1504/ijkms.2022.126151>
- Becerra-Fernandez, I., & Sabherwal, R. (2014). *Knowledge management: Systems and processes* (2nd ed.). Routledge. <https://doi.org/10.4324/9781315715117>
- Checkland, P., & Poulter, J. (2007). *Learning For Action: A Short Definitive Account of Soft Systems Methodology, and its use for Practitioners, Teachers and Students*. Wiley. <https://books.google.com.pk/books?id=YKaIEAAQBAJ>
- Chu, W., Liu, H., & Fang, F. (2021). A tale of three excellent chinese efl teachers: Unpacking teacher professional qualities for their sustainable career trajectories from an ecological perspective. *Sustainability (Switzerland)*, 13(12), 6721-6721. <https://doi.org/10.3390/su13126721>
- Cullinane, A., & Erduran, S. (2023). Nature of Science in Preservice Science Teacher Education—Case Studies of Irish Pre-service Science Teachers. *Journal of Science Teacher Education*, 34(2), 201-223. <https://doi.org/10.1080/1046560X.2022.2042978>

- Cushing, I. (2021). 'Say it like the Queen': the standard language ideology and language policy making in English primary schools. *Language, Culture and Curriculum*, 34(3), 321-336. <https://doi.org/10.1080/07908318.2020.1840578>
- Dalkir, K. (2013). *Knowledge Management in Theory and Practice*. Routledge. <https://doi.org/10.4324/9780080547367>
- Daly-Smith, A., Quarmby, T., Archbold, V. S. J., Routen, A. C., Morris, J. L., Gammon, C., Bartholomew, J. B., Resaland, G. K., Llewellyn, B., Allman, R., & Dorling, H. (2020). Implementing physically active learning: Future directions for research, policy, and practice. *Journal of Sport and Health Science*, 9(1), 41-49. <https://doi.org/10.1016/j.jshs.2019.05.007>
- Dewantara, I. P. M. (2020). Curriculum changes in Indonesia: Teacher constraints and students of prospective teachers' readiness in the implementation of thematic learning at low grade primary school. *Elementary Education Online*, 19(2), 1047-1060. <https://doi.org/10.17051/ilkonline.2020.696686>
- Dewi, R. S. I., & Mudrikah, M. (2023). Analysis of the Implementation of the Merdeka Curriculum in Sekolah Penggerak at SDN 1 Selorejo, Dau District, Malang Regency. *Jurnal Simki Pedagogia*, 6(2), 500-511. <https://doi.org/10.29407/jsp.v6i2.327>
- Farmer, L. S. J. (2019). School librarians in Sweden: A case study in change. *IFLA Journal*, 45(4), 344-352. <https://doi.org/10.1177/0340035219845018>
- Fredriksson, U., Kusanagi, K. N., Gougoulakis, P., Matsuda, Y., & Kitamura, Y. (2020). A comparative study of curriculums for Education for Sustainable Development (ESD) in Sweden and Japan. *Sustainability (Switzerland)*, 12(3), 1123-1123. <https://doi.org/10.3390/su12031123>
- Fullan, M. (2016). *The New Meaning of Educational Change, Fifth Edition* (5th ed.). Teachers College Press. <https://books.google.com.pk/books?id=YxGTCwAAQBAJ>
- Grefalda, L. B., Pulhin, J. M., Tapia, M. A., Anacio, D. B., De Luna, C. C., Sabino, L. L., Garcia, J. E., Peria, A. S., Peras, R. J. J., Gevaña, D. T., & Inoue, M. (2020). Building institutional resilience in the context of climate change in Aurora, Philippines. *Environmental Research*, 186, 109584-109584. <https://doi.org/10.1016/j.envres.2020.109584>
- Hedar, A., Sensuse, D. I., & Sandhyaduhita, P. (2016). Knowledge management readiness of research agencies: A case of BATAN Indonesia. 2016 International Conference on Informatics and Computing (ICIC), <https://doi.org/10.1109/IAC.2016.7905693>
- Hidayat, E., Pardosi, A., & Zulkarnaen, I. (2023). The Effectiveness of School Principals' Leadership in the Implementation of the Merdeka Curriculum. *Jurnal Studi Guru dan Pembelajaran*, 6(1), 9-18. <https://doi.org/10.30605/jsgp.6.1.2023.2339>
- Larke, L. R. (2019). Agentic neglect: Teachers as gatekeepers of England's national computing curriculum. *British Journal of Educational Technology*, 50(3), 1137-1150. <https://doi.org/10.1111/bjet.12744>
- Liu, S. H., & Lee, G. G. (2013). Using a concept map knowledge management system to enhance the learning of biology. *Computers and Education*, 68, 105-116. <https://doi.org/10.1016/j.compedu.2013.05.007>
- Mahdum, M., Hadriana, H., & Safriyanti, M. (2019). Exploring teacher perceptions and motivations to ICT use in learning activities in Indonesia. *Journal of Information Technology Education: Research*, 18, 293-317. <https://doi.org/10.28945/4366>

- Manyukhina, Y., & Wyse, D. (2019). Learner agency and the curriculum: a critical realist perspective. *Curriculum Journal*, 30(3), 223-243. <https://doi.org/10.1080/09585176.2019.1599973>
- Nonaka, I., & Takeuchi, H. (1995). *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation*. Oxford University Press. <https://doi.org/10.1093/oso/9780195092691.001.0001>
- OECD, R. (2019). Programme for international student assessment (pisa)-results from pisa 2018. *Oecd*, 1-10. [https://www.oecd.org/pisa/publications/PISA2018\\_CN\\_IDN.pdf](https://www.oecd.org/pisa/publications/PISA2018_CN_IDN.pdf)
- Pisa, O. (2019). *Results (Volume I): What students know and can do*. Organization for Economic Cooperation and Development (OECD): Paris, France. [https://www.oecd.org/en/publications/2019/12/pisa-2018-results-volume-i\\_947e3529.html](https://www.oecd.org/en/publications/2019/12/pisa-2018-results-volume-i_947e3529.html)
- Rawling, E. (2020). How and why national curriculum frameworks are failing geography. *Geography*, 105(2), 69-77. <https://doi.org/10.1080/00167487.2020.12094091>
- Salokangas, M., Wermke, W., & Harvey, G. (2020). Teachers' autonomy deconstructed: Irish and Finnish teachers' perceptions of decision-making and control. *European Educational Research Journal*, 19(4), 329-350. <https://doi.org/10.1177/1474904119868378>
- Sinnema, C., Nieveen, N., & Priestley, M. (2020). Successful futures, successful curriculum: What can Wales learn from international curriculum reforms? *Curriculum Journal*, 31(2), 181-201. <https://doi.org/10.1002/curj.17>
- Siuko, V., Myllärniemi, J., & Hellsten, P. (2023). Towards Digital Transformation: Knowledge Management as an Enabler in a Public Sector Asset Lifecycle. International Conference on Knowledge Management and Information Systems, <https://doi.org/10.5220/0012164700003598>
- Suyadi, Selvi, I. D., Sibawaihi, Zahroh, U., & Muassomah. (2023). Children's Future Adversity: Learning Loss Risk during Online Learning in Covid-19 Pandemic. *International Journal of Instruction*, 16(2), 457-478. <https://doi.org/10.29333/iji.2023.16225a>
- Tikkanen, L., Pyhältö, K., Pietarinen, J., & Soini, T. (2020). Lessons learnt from a large-scale curriculum reform: The strategies to enhance development work and reduce reform-related stress. *Journal of Educational Change*, 21(4), 543-567. <https://doi.org/10.1007/s10833-019-09363-1>
- Wahyudin, D., & Suwirta, A. (2020). Politics of curriculum in the educational system in Indonesia. *TAWARIKH*, 11(2), 143-158. <https://journals.mindamas.com/index.php/tawarikh/article/view/1307>
- Warsihna, J., Ramdani, Z., Amri, A., Anas, Z., & Anggraena, Y. (2023). Challenges and strategies for implementing the independent curriculum at the elementary school level: A multi-perspective finding. Kwangsan. *Journal of Educational Technology*, 11(1), 296-311. <https://www.researchgate.net/publication/372458743>