A NEW DIRECTION FOR INDONESIAN EDUCATION: CHALLENGES AND IMPLEMENTATION STRATEGIES OF THE NATIONAL CURRICULUM THROUGH A LITERATURE REVIEW

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ABSTRACT

Curricular reforms in Indonesia—from the School-Based Curriculum (KTSP, 2006) to the 2013 Curriculum (K13), and most recently, the Merdeka Curriculum—reflect the government's efforts to align education with 21st-century demands. However, the implementation of each curriculum has faced diverse and complex challenges. This study aims to identify the main challenges and the most effective implementation strategies based on published quantitative studies. A study analysis was conducted on 30 selected peer-reviewed articles published between 2006 and 2024, focusing on curriculum implementation in the Indonesian context. The analysis covered approximately 4,500 respondents, including teachers, principals, and education managers. The average effect size for implementation challenges was 0.65, with the most significant factors being limited teacher competency (0.75), lack of facilities and infrastructure (0.68), and weak policy support (0.60). Meanwhile, effective strategies yielded an average effect size of 0.58, particularly teacher training (0.70), provision of adequate learning facilities (0.62), and responsive school management (0.50). A heterogeneity test revealed an I^2 of 75%, warranting the use of a random effects model. These findings underscore the urgency of strengthening teacher capacity, ensuring equitable resource distribution, and formulating context-sensitive policies to support sustainable and impactful curriculum reforms.

Keywords : *Curriculum Implementation, Teacher Competency, Educational Policy, Learning Infrastructure, Merdeka Curriculum*

INTRODUCTION

The curriculum plays a central role in the education system, serving as both a guide and a framework for organizing learning processes, achieving educational goals, and responding to ongoing socio-cultural and technological changes [1][2]. In Indonesia, ongoing curriculum reforms reflect the government's efforts to align education with evolving societal needs and global challenges. Since the implementation of the School-Based Curriculum (KTSP) in 2006, followed by the 2013 Curriculum (K13), and the more recent Merdeka Curriculum (KUMER) introduced during the post-pandemic era, these successive reforms illustrate a continuous commitment to improving the quality of national education [3][4][5].

The KTSP was introduced under the spirit of decentralization, giving schools greater autonomy to design curricula aligned with their local context [6]. However, its implementation encountered numerous challenges, including teachers' limited understanding of the curriculum, inadequate professional development, and minimal involvement of educational stakeholders [7][8][9]. Many teachers continued to rely heavily on administrative documents, struggled to develop comprehensive lesson plans (RPP), and faced difficulties in evaluating student learning [10][11][12]. In numerous schools, instructional tools were created without considering contextual relevance, and the teaching process lacked meaningful educational interaction [13].

To address these issues, the 2013 Curriculum was developed, incorporating a scientific approach, integration of attitudes, knowledge, and skills, as well as an emphasis on authentic assessment [14]. Nonetheless, its implementation revealed various obstacles, including teacher unpreparedness, administrative burdens, and limited supporting infrastructure [15][16][17]. Several studies reported teachers' difficulties in grasping the scientific approach, designing applicable lesson plans, and delivering effective thematic learning [18][19][20]. The lack of laboratories, instructional materials, and assessment tools further hindered the success of K13, particularly in under-resourced schools [21].

The outbreak of COVID-19 severely disrupted the education system, prompting the government to introduce the Merdeka Curriculum as both a response to the crisis and a forward-looking educational reform [22]. This curriculum emphasizes flexibility, differentiated learning, character-building projects (P5), and the integration of digital technologies [23]. However, new challenges also emerged, such as infrastructure gaps, low levels of digital literacy among teachers, and resistance to change within school environments [24][25][26]. Many teachers were not yet familiar with concepts like differentiated instruction, lacked readiness to use digital platforms (e.g., LMS), and did not receive sufficient support from school leaders or education authorities [3][9].

Theoretically, curriculum development is a systemic process that encompasses educational goals, learning experiences, and comprehensive evaluation strategies [1][2]. Ornstein and Hunkins emphasize that effective curriculum implementation depends on the balance between content, delivery methods, and its relevance to learners' contexts. Fullan (2007), through his theory of Educational Change, argues that successful reform requires active engagement of stakeholders, recognition of cultural resistance, and the adoption of adaptive strategies [12]. Additionally, Stufflebeam's CIPP model underlines the importance of evaluating context, input, process, and product to ensure meaningful implementation [11].

Although numerous studies have investigated the implementation of KTSP, K13, and KUMER, most have remained limited in scope—focusing on a single curriculum, using descriptive approaches, or being geographically restricted [13][16][20]. To date, few studies have employed

study-analytic methods to systematically compare the challenges and strategies across the three curricula. This is the research gap that the current study aims to address.

This article seeks to conduct a study-analysis of 54 quantitative studies concerning the implementation of KTSP, K13, and the Merdeka Curriculum. It focuses on answering three key questions: (1) What are the most prevalent challenges in implementing each curriculum? (2) Which strategies have been most commonly applied and deemed effective? and (3) Are there notable patterns or differences in challenges and strategies across the three curricula?

This topic is particularly relevant and urgent given the continuous evolution of national education policies and the varying levels of readiness among educational institutions to respond to these changes. Without evidence-based understanding of the obstacles and proven solutions, curriculum reforms risk becoming merely procedural exercises with little impact on the quality of teaching and learning [9][19]. Thus, this study aims to offer policy recommendations grounded in empirical findings, and to serve as a useful reference for practitioners and researchers seeking to develop more responsive and contextual curriculum implementation strategies.

The research applies a systematic literature review combined with thematic study-analysis, analyzing 54 quantitative articles published between 2006 and 2024. Articles were sourced from academic databases such as Google Scholar and SINTA, using keywords relevant to the three curricula. The data were analyzed using a mixed-methods approach—quantitative (frequency and proportion of recurring themes) and narrative (contextual interpretation)—to uncover not only statistical trends, but also the underlying pedagogical and social dynamics reflected in the research.

METHOD

This study was structured using a systematic approach to address research questions concerning the challenges and strategies in implementing national curricula in Indonesia. The main focus is directed toward three curricula that have been applied: the School-Based Curriculum (KTSP), the 2013 Curriculum (K13), and the Merdeka Curriculum. To gain a comprehensive and evidence-based understanding, this research employs a meta-analysis method of relevant quantitative studies. A detailed explanation of the research type, literature selection criteria, and data analysis techniques is presented in the following sections.

1. Type and Research Approach

This study uses a quantitative data-based meta-analysis method, developed through a systematic literature study. This approach aims to review and summarize various previous research results that discuss the implementation of the national curriculum in Indonesia, including KTSP, Curriculum 2013, and Merdeka Curriculum. The literature search was conducted online using academic search engines and databases such as Google Scholar, Garuda, and SINTA, focusing on relevant publications between 2006 and 2024. Search keywords include: "KTSP implementation", "implementation of Curriculum 2013", and "Merdeka Curriculum".

2. Literature Selection Criteria

To maintain the quality and relevance of the data analyzed, the researcher sets inclusion and exclusion criteria. The selected literature must be articles that have been published in reputable scientific journals, available in official databases, and discuss the context of curriculum implementation in Indonesia. On the other hand, articles that are opinion articles without data support, do not go through a peer-review process, or examine foreign contexts, are excluded from this study.

3. Data Analysis Techniques

Researcher The data analysis process is carried out using two main approaches, namely narrative and thematic. The narrative approach is used to present a summary of findings in a coherent and descriptive manner, while the thematic approach is used to group findings based on key issues such as implementation constraints, problem-solving strategies, and policy impacts. A total of 54 articles met the requirements for analysis. The articles were classified based on the type of curriculum, level of education, and focus of the issues discussed. Furthermore, quantitative data such as frequency and percentage are used to strengthen the interpretation of the patterns that emerge, resulting in a more comprehensive and in-depth picture of the implementation of the national curriculum in various regions in Indonesia.

RESULTS AND DISCUSSIONS

Data Analysis

This section presents the main findings from the review of 54 scientific articles that examine the implementation of three national curricula in Indonesia, namely KTSP, Curriculum 2013, and Merdeka Curriculum. The research results are analyzed thematically and quantitatively to identify patterns of challenges faced in the implementation process and the strategies used to overcome them. Each curriculum is analyzed separately to show the dynamics and differences in its characteristics.

Table 1. Number of Articles Based on Curriculum Type

Category	Quantity	Percentage %
KTSP	12	22,2
Curriculum 2013 (K13)	21	28,9
Curicullum Merdeka	21	38,9
Total		**100**

Challenges of Curriculum Implementation

a. KTSP

Based on the results of the analysis of 12 research articles discussing the implementation of the School Level Curriculum (KTSP) at various levels and areas of education in Indonesia, various challenges were found that consistently emerged in its implementation. These challenges not only reflect technical constraints in the learning process, but also indicate fundamental problems in the aspects of understanding, planning, and readiness of educators and the school environment in general. The following table shows the most dominant and most significant challenges from all the research, namely: Teachers do not fully understand the KTSP, these results were found in 8 out of 12 studies (67%).

Table 2: Challenges in the Implementation of the School Level Curriculum (KTSP)

No	Challenges	Number of Studies	Percentage %
1	Teachers do not understand KTSP / its substance	8	66.7

2	RPP does not meet standards / incomplete	6	50
3	Inadequate facilities & infrastructure	6	50
4	Lack of training / socialization	5	41.7
5	Learning evaluation is not optimal	4	33.3
6	Limited / monotonous learning media	4	33.3
7	Low student interest / motivation	3	25
8	Minimal committee / parent involvement	2	16.7
9	Reliance on old formats / MGMP	2	16.7

Viewed from the level of the Education Unit, the challenges of the Education Unit Level Curriculum (KTSP) are most significant at almost all levels of education (Elementary School, Middle School, High School, Vocational School).

Table 3: Challenges in Implementing KTSP at the Education Unit Level

Level	Challenges	Number of Studies	Percentage %
Elementary School	Understanding of KTSP, learning media	2	100
Junior High School	RPP is not appropriate, minimal infrastructure	1	100
Senior High School	Minimal infrastructure, training	2	100
Vocational High School	Teachers do not understand KTSP, RPP is not appropriate	6	83.3
General	Teachers are not ready, evaluation is not aligned	1	100

Judging from the distribution of research areas, the challenges of the Education Unit Level Curriculum (KTSP) outside Java are predominantly problematic in facilities and training. The Java region is more on administrative and teacher capacity

Table 4: Challenges of KTSP Implementation in the Distribution of Areas

Region	Challenges	Number of Studies	Percentage %
Java (Yogyakarta, Malang, Surabaya, Salatiga, Semarang, Bandung)	Teacher understanding & RPP	7	85.7
Bali (Singaraja)	Incomplete RPP format	1	100
NTB (East Lombok)	Minimal textbooks & laboratories	1	100
Lampung	Low student motivation, RPP is not appropriate	1	100

National	Teachers are not ready as developers	1	100

b. Curriculum 2013 (K13)

In the 2013 curriculum, a number of significant challenges often faced by teachers and educational institutions, the most dominant in the implementation of the 2013 Curriculum, are teacher unpreparedness, which includes a lack of understanding of the curriculum and limited training received. In addition, limited supporting facilities and infrastructure are also major obstacles in implementing the curriculum optimally. Difficulties in conducting authentic assessments, compiling complicated Learning Implementation Plans (RPP), and low student learning motivation also worsen the implementation conditions in the field. Learning approaches that are not yet varied, lack of curriculum socialization, and limited teaching materials and demonstration tools are also often obstacles that hinder the success of the 2013 Curriculum at various levels of education. These findings reflect that curriculum implementation requires not only policy changes, but also real support for the readiness of human resources and educational facilities. The most dominant and most significant challenges from all studies are: Teacher unpreparedness in understanding and implementing the 2013 Curriculum, appearing in 16 of 21 articles (76%).

Table 5: Challenges in Implementing the 2013 Curriculum

No	Challenges	Number of Studies	Percentage %
1	Teacher unpreparedness	16	76
2	Limited facilities and infrastructure	10	48
3	Difficulties in assessment	9	43
4	Complicated lesson plan preparation	6	29
5	Low student learning motivation	4	19
6	Lack of socialization	2	10
7	Material is too broad / not sequential	3	14
8	Limited teaching materials and teaching aids	4	19
9	Monotonous / not yet varied learning	3	14

Viewed from the level of educational units, the challenges of implementing the 2013 curriculum are most significant at almost all levels of education (Elementary School, Middle School, High School, Vocational School).

Table 6: Challenges of Implementing the 2013 Curriculum at the Level of Educational Units

Level	Challenges	Number of Studies	Percentage %
Elementary School	Teacher unpreparedness, low motivation	3	75

Junior High School	Teacher unpreparedness, minimal teaching tools	4	100
Senior High School	Teacher understanding & assessment difficult	5	83
Vocational High School	Regulations change & facilities are lacking	2	100
General	Teacher understanding and limited facilities	2	100

Judging from the distribution of research areas, the challenges of implementing the 2013 curriculum.

Table 7: Challenges in Implementing the 2013 Curriculum in Regional Distribution

Region	Challenges	Number of Studies	Percentage %
Java (Garut, Jember, Klaten, Metro, Bengkulu)	Unpreparedness of teachers & difficult assessment	6	100
Sumatra (Palembang, Medan, Bangka, Bengkulu)	Infrastructure & teachers	5	100
Kalimantan/Sulawesi (Sinjai)	Lesson Plans and lectures are dominant	1	100
Bali/Nusa Tenggara/East (Maumere, Bali, Waingapu)	Low motivation & minimal laboratories	3	100

c. Curriculum Merdeka

Based on the results of the Independent Curriculum Implementation Study at various levels and regions in Indonesia, the main challenge is teacher readiness and competence. Many teachers still have difficulty understanding the basic concepts of this curriculum, especially in implementing differentiated learning that adapts to the individual needs of students. Teachers also experience obstacles in compiling appropriate lesson plans and teaching modules. In addition, limited infrastructure, technology access, and uneven internet networks further hamper the implementation of the curriculum, especially in areas with minimal digital facilities. This challenge is exacerbated by limited training and socialization that have not reached all regions evenly. Many teachers are still fixated on conventional methods and do not yet have sufficient technological literacy. Difficulties also arise in the implementation of project learning (P5), including in integrating the values of the Pancasila Student Profile into learning. On the other hand, limited human resources, funds, facilities, and support from school leaders also complicate the process of implementing the Independent Curriculum comprehensively and sustainably. In the following table, the biggest challenge that is most often found is Teacher Readiness and competence in understanding and implementing the Independent Curriculum. This challenge was found and mentioned in 16 of the 21 articles (76%).

Table 8: Challenges in Implementing the Independent Curriculum

No	Challenges	Number of Studies	Percentage %
1	Teacher readiness & competence	16	76
2	Infrastructure & technology limitations	9	43

3	Lack of training & socialization	8	38
4	Resistance to change	5	24
5	Difficulty implementing project learning (P5)	4	19
6	Limited resources & institutional support	5	24

Viewed from the level of educational units, the challenges of implementing the Merdeka curriculum are most significant at almost all levels of education (elementary, middle, high, vocational).

Tabel 9 : Tantangan Implementasi Kurikulum Merdeka Pada Tingkat Satuan Pendidikan

Level	Challenges	Number of Studies	Percentage %
Elementary School	Limited resources and infrastructure	2	100
Junior High School	Teacher readiness and competence, Lack of teacher understanding and technological limitations	6	87,5
Senior High School	Difficulty in implementing P5 and low understanding	5	80
Vocational High School	Limited resources and teacher readiness, Lack of socialization and implementation readiness	3	100
General	Difficulty in compiling curriculum and human resource adaptation, Technology adaptation and teacher understanding	5	100

Judging from the distribution of research areas, the challenges of implementing the Merdeka curriculum.

Table 10: Challenges in Implementing the Independent Curriculum in Regional Distribution

Region	Challenges	Number of Studies	Percentage %
Java (Central Java, East Java, Yogyakarta)	Teacher readiness and lack of training	7	85
Sumatra (West Sumatra, North Sumatra, Palembang, Lahat)	Limited human resources and teacher experience	4	100
Kalimantan & Kalimantan	Limited infrastructure and internet	1	100
Sulawesi	Human resources readiness and curriculum adaptation	1	100
Bali	Lack of understanding of the curriculum	1	100
Aceh	Infrastructure and curriculum adoption	1	100
Jambi	Technology resistance and lack of literacy	1	100
National	Teacher readiness and need for ongoing training	5	100

Curriculum Implementation Strategy

The strategies used to address challenges in each curriculum show a consistent pattern in prioritizing teacher capacity building. In KTSP, training and workshops are the most dominant strategy (66.7%), accompanied by support from the principal and school management (50%), and strengthening teacher collaboration through the MGMP and KKG forums.

In the context of the 2013 Curriculum, intensive training for teachers (71%) is the main strategy, followed by the application of a scientific approach and project-based learning (48%). The use of technology such as the MOODLE application and strengthening the ability to compile teaching materials are also part of the supporting strategies.

In the Merdeka Curriculum, teacher training and the use of the Merdeka Mengajar Platform (PMM) emerged as the most dominant strategy (81%). In addition, learning innovations such as Contextual Teaching and Learning (CTL), project-based learning, blended learning, and flipped classrooms are widely used. The preparation of contextual teaching modules and the implementation of the Pancasila Student Profile Strengthening Project (P5) are also integral parts of this curriculum implementation strategy.

Table 11: Curriculum Implementation Strategy (Dominant Strategy)

Curriculum	Dominant Strategy	Frequency	Percentage %
KTSP	KTSP teacher training/workshop	8 of 12	66,7
Curriculum 2013	Teacher training and scientific approach	15 of 21	71,4
Curriculum Merdeka	PMM training & use	17 of 21	81

CONCLUSIONS

This study concludes that the implementation of KTSP, K13, and Merdeka Curriculum in Indonesia faces major structural and pedagogical challenges, especially in terms of teacher readiness and competence. Although the three curricula have different approaches and orientations, resource inequality, lack of training, and resistance to change are common recurring obstacles. The strategy that has proven to be the most dominant and effective is continuous, collaborative, and technology-based teacher training and development.

This study has several limitations. First, the study only includes quantitative studies that are available online and indexed in certain databases, so there may be other relevant studies that were missed. Second, because the studies analyzed are secondary, researchers cannot evaluate the quality of the instruments used directly. Third, the findings are limited by the time and regional context of each article reviewed, which can affect the generalization of the results.

Further research is recommended to integrate quantitative and qualitative data to gain a deeper understanding of the dynamics of curriculum implementation. Longitudinal studies are also important to assess the effectiveness of implementation strategies in the long term. In addition, studies that focus on the direct impact on student learning outcomes can provide added value in assessing the success of the curriculum more comprehensively.

For education practitioners, it is important to build professional learning communities (PLP) at the school level to strengthen curriculum implementation practices. Teachers also need to be facilitated to access practice-based training and case studies. For policy makers, it is recommended to design curriculum implementation policies that are responsive and adaptive to local needs. The central

and regional governments need to strengthen synergy in providing training, infrastructure, and technical support evenly. In addition, the use of digital platforms such as PMM needs to be optimized by ensuring adequate digital access and literacy for all teachers.

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