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Implementing the Merdeka Curriculum in Primary Education: Evidence from Grade I and IV Teachers at Sungai Raya 01 Public Elementary School

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Abstract

Purpose: This study examined Grade I and Grade IV teachers' understanding, perceptions, planning, and classroom enactment of the Merdeka Curriculum at Sungai Raya 01 Public Elementary School, Indonesia. Method: A convergent mixed-methods case study was conducted from September 4 to October 23, 2024. Participants were six classroom teachers, including three Grade I teachers and three Grade IV teachers, selected through total sampling. Quantitative data were collected using a 25-item curriculum-understanding test, a 15-item perception questionnaire, and a structured classroom-observation instrument. Qualitative data were obtained through semi-structured interviews, field notes, and available teaching modules. Quantitative data were analyzed descriptively, qualitative data were analyzed thematically, and both strands were integrated through comparison. Main findings: Teachers achieved a mean understanding score of 83.67 and an overall perception score of 85.33%, both categorized as very good. External curriculum-related stimuli received the highest perception score at 93.33%, compared with individual understanding at 82.67% and individual evaluation at 82.22%. Classroom implementation scored 94.60%. Teachers prepared teaching modules under the supervision of the school principal, considered learning outcomes, used diagnostic assessment, and implemented student-centered and differentiated activities across introductory, core, and closing phases. However, technology-based instruction was not observed, and the formative use of assessment evidence was not fully documented. Novelty/originality: The study moves beyond single-source evaluations by distinguishing teachers' knowledge, perceptions, reported planning, and observed practices within one integrated analytical framework. Contribution: It demonstrates that favorable perceptions and high scores do not necessarily indicate complete implementation. The findings provide contextual evidence for designing school-based professional development focused on differentiation, formative assessment, instructional technology, and stronger alignment between curriculum knowledge and classroom enactment in Indonesian primary education.

Keywords: classroom enactment; differentiated instruction; Merdeka Curriculum; primary education; teacher perception

Introduction

Education is fundamental to the development of human capital and the long-term social and economic advancement of Indonesia. High-quality education is expected not only to improve students' knowledge and competencies but also to cultivate ethical, creative, independent, and responsible citizens capable of participating in an increasingly competitive and technologically dynamic world. These expectations are consistent with the national education objectives stipulated in Law of the Republic of Indonesia Number 20 of 2003 concerning the National Education System. The law emphasizes that national education should develop learners' potential so that they become individuals who have faith and noble character and who are knowledgeable, capable, creative, independent, democratic, and responsible. Within this national framework, the curriculum serves as a strategic instrument that translates educational aspirations into learning objectives, instructional content, pedagogical practices, and assessment processes.

Curriculum reform is particularly important when an education system must respond to rapid social, technological, and economic changes. However, introducing a new curriculum does not automatically transform classroom practices. Curriculum policies are interpreted and enacted by teachers within particular institutional and classroom contexts. Spillane et al. (2002) explain that educational policy implementation is a process of interpretation and sense-making in which practitioners connect new policy messages with their prior knowledge, beliefs, and experiences. Similarly, Datnow (2020) argues that teachers should not be regarded merely as recipients of reform because their professional agency, collaboration, capacity, and working conditions substantially shape how reform is implemented. Therefore, the success of curriculum reform depends not only on the quality of its official design but also on teachers' understanding of the curriculum, their perceptions of the reform, and their capacity to translate its principles into instructional practices.

In Indonesia, the Merdeka Curriculum was officially introduced on February 11, 2022, as part of the government's effort to address the continuing learning crisis and promote post-pandemic learning recovery (Ministry of Education, Culture, Research, and Technology [Kemendikbudristek], 2022). The curriculum provides schools and teachers with greater flexibility to organize learning according to students' developmental stages, needs, and local contexts. Its principal features include a stronger focus on essential content, project-based activities intended to strengthen the Pancasila Student Profile, student-centered learning, and more flexible instructional planning. The curriculum is consequently expected to help students acquire knowledge, character, and twenty-first-century competencies that are relevant to a changing social and technological environment. This flexibility, however, simultaneously places greater professional demands on teachers because they must interpret learning outcomes, develop teaching modules, select appropriate instructional models, diagnose students' needs, and adjust instruction accordingly.

Assessment is also positioned as an integral component of learning in the Merdeka Curriculum. Teachers are expected to use diagnostic and formative assessment to identify students' learning needs, adjust subsequent instruction, and provide appropriate follow-up, while summative assessment is used to evaluate achievement at the end of a learning period (Kemendikbudristek, 2022). This orientation is consistent with the broader conception of formative assessment as a process through which evidence of student learning is elicited, interpreted, and used to make better instructional decisions (Black & Wiliam, 2009). In this context, assessment is not limited to documenting learning outcomes but supports differentiated and responsive instruction. Evidence from primary education indicates that differentiation can contribute positively to student performance when it is implemented as part of a coherent instructional approach rather than merely through ability grouping (Deunk et al., 2018). Nevertheless, differentiated instruction remains complex because teachers must align learning objectives, content, instructional activities, resources, and assessment with diverse levels of student readiness.

Teachers are therefore central to the implementation of the Merdeka Curriculum. Their curriculum knowledge influences how accurately they interpret policy expectations, whereas their perceptions may affect their willingness, motivation, and commitment to enact instructional change. Previous Indonesian studies have generally reported positive teacher responses to the Merdeka Curriculum and have emphasized the importance of teacher readiness in supporting its implementation (Arofaturrohman et al., 2023; Rahayuningsih & Hanif, 2024). Putri and Nukman (2024) also highlight the important role of teachers in translating the curriculum into meaningful primary-school learning. Nevertheless, positive perceptions or high levels of self-reported understanding do not necessarily guarantee consistent classroom implementation. Research involving Indonesian teachers has demonstrated that differentiated instruction is associated with teachers' self-efficacy, constructivist beliefs, professional development, teaching experience, and classroom conditions (Suprayogi et al., 2017). This suggests that teachers' understanding, perceptions, planning, and observable instructional practices need to be examined together rather than treated as interchangeable indicators of successful curriculum implementation.

Continuous professional development is important for narrowing the gap between policy expectations and classroom practice. Training may strengthen teachers' knowledge and attitudes, but its effectiveness depends on its duration, relevance, active-learning opportunities, collaborative features, and connection to teachers' instructional contexts. A meta-analysis by Kahmann et al. (2022) found that professional-development programs on differentiated instruction had a moderate positive effect on teachers' knowledge, attitudes, and practices, although improvement in teacher outcomes did not automatically produce significant gains in student learning. More recent evidence similarly indicates that effective preparation for differentiated instruction should combine active learning, collaboration, reflection, and sustained school-level support (Langelaan et al., 2024).

Consequently, participation in curriculum training should not be treated as sufficient evidence that teachers have fully understood or consistently implemented the intended curriculum. Empirical investigation must also consider how teachers plan lessons, conduct classroom activities, use assessment evidence, respond to student diversity, and employ available learning resources and technologies.

Despite the growing literature on the Merdeka Curriculum, several gaps remain. First, many studies discuss teacher readiness or perceptions without directly comparing these perceptions with teachers' demonstrated curriculum knowledge and observable instructional practices. Second, studies frequently report implementation in broad evaluative categories, such as "good" or "very good," without sufficiently examining how curriculum principles are enacted during lesson planning, introductory activities, core learning activities, assessment, reflection, and follow-up. Third, evidence from individual primary schools, particularly regarding the experiences of teachers responsible for different curriculum phases, remains contextually limited. Grade I and Grade IV teachers are especially relevant because they teach students at different developmental stages and face different requirements when interpreting learning outcomes, designing teaching modules, implementing differentiated instruction, and managing classroom assessment. Examining these teachers together can provide a more comprehensive understanding of how the same curriculum policy is interpreted and enacted across grade levels.

Sungai Raya 01 Public Elementary School began implementing the Merdeka Curriculum in Grades I and IV in the 2022 academic year and subsequently extended its implementation to Grades II and V in 2023. The teachers had received training organized by the Education and Culture Office of Kubu Raya Regency. Nevertheless, formal participation in training does not by itself establish the extent to which teachers understand the curriculum, perceive it positively, and consistently translate its principles into classroom practice. A systematic investigation is therefore needed to examine the correspondence—and possible gaps—among teachers' curriculum knowledge, perceptions, instructional planning, and observed teaching practices in this specific school context.

Accordingly, this study aims to investigate the implementation of the Merdeka Curriculum by Grade I and Grade IV teachers at Sungai Raya 01 Public Elementary School by examining three interconnected dimensions: teachers' understanding of the curriculum, their perceptions of its implementation, and their planning and enactment of classroom instruction. The study addresses the following research questions: (1) How well do Grade I and Grade IV teachers understand the principles and components of the Merdeka Curriculum? (2) How do these teachers perceive the implementation of the curriculum? and (3) How are the principles of the Merdeka Curriculum reflected in lesson planning and classroom practices? By integrating evidence concerning knowledge, perceptions, planning, and classroom enactment, the study is expected to provide a more context-sensitive account of curriculum implementation and to identify areas requiring targeted professional development and school-level support. Given its small, school-specific scope,

the study does not seek statistical generalization; rather, it offers contextual evidence that may inform curriculum implementation and teacher-development initiatives in comparable Indonesian primary-school settings.

Method

This study employed a convergent mixed-methods case study design to investigate the implementation of the Merdeka Curriculum by Grade I and Grade IV teachers at Sungai Raya 01 Public Elementary School. This design was selected because the study combined quantitative data from a curriculum-understanding test, teacher-perception questionnaire, and structured classroom-observation instrument with qualitative data obtained through semi-structured interviews and field observations. Mixed-methods research integrates quantitative and qualitative components to provide a broader and more detailed understanding of a research problem than either approach can provide independently (Schoonenboom & Johnson, 2017). In this study, the quantitative and qualitative data were collected during the same research period, analyzed separately, and subsequently compared during interpretation. This procedure followed the principle of convergence, in which findings from different sources are integrated to identify confirmation, complementarity, or divergence (Fetters et al., 2013).

The qualitative component was informed by the descriptive qualitative approach described by Sugiyono (2020, p. 9), in which research is conducted in a natural setting and the researcher serves as the primary instrument for interpreting the meaning of the phenomenon. Bogdan and Biklen, as cited in Sugiyono (2020, p. 7), explain that descriptive qualitative research primarily produces data in the form of words and detailed descriptions. In the present study, the qualitative component was used to obtain contextual explanations of how teachers understood, planned, and implemented the Merdeka Curriculum. The quantitative component was used descriptively to summarize teachers' curriculum-understanding scores, perceptions, and observed teaching practices. No inferential statistical analysis was conducted because the study involved only six teachers within a single-school case and did not seek statistical generalization.

The study was conducted at Sungai Raya 01 Public Elementary School, Kubu Raya Regency, West Kalimantan, Indonesia, from September 4 to October 23, 2024. The school began implementing the Merdeka Curriculum in Grades I and IV in the 2022 academic year and extended its implementation to Grades II and V in 2023. Before the study, teachers at the school had participated in training provided by the Education and Culture Office of Kubu Raya Regency. The participants were six classroom teachers, comprising three Grade I teachers and three Grade IV teachers from Classes I-A, I-B, I-C, IV-A, IV-B, and IV-C. A total-sampling strategy was used because all teachers responsible for Grades I and IV at the research site were included. The inclusion criteria required participants to be active classroom teachers at the school, to teach Grade I or Grade IV during the research period, and to have direct experience implementing the Merdeka Curriculum. The participants were assigned anonymous codes from T1 to T6 to protect their identities.

Four instruments were used to collect the data. The first was a 25-item multiple-choice test designed to assess teachers' understanding of the principles and components of the Merdeka Curriculum. The test covered the curriculum's underlying principles, learning outcomes, teaching modules, student-centered learning, differentiated instruction, diagnostic assessment, formative assessment, and summative assessment. Each correct response received one point, while an incorrect response received zero. The raw score was converted into a percentage by dividing the number of correct answers by the maximum possible score and multiplying the result by 100. Before administration, the test was reviewed by two *Guru Penggerak*, or certified teacher leaders, who served as expert validators. They examined the relevance of each item to the intended construct, its alignment with the Merdeka Curriculum, the clarity of its language, and its appropriateness for primary-school teachers. The instrument was revised in response to the validators' comments before being administered to the participants.

The second instrument was a 15-item teacher-perception questionnaire using a five-point Likert scale ranging from 1, indicating the lowest level of agreement, to 5, indicating the highest level of agreement. The questionnaire covered three dimensions: teachers' understanding of the perceived object, external information or stimuli received by teachers, and teachers' evaluation of the perceived object. The first dimension consisted of five items, the second consisted of four items, and the third consisted of six items. The percentage for each dimension was calculated by dividing the observed score by the maximum possible score and multiplying the result by 100. The scores were interpreted using the following categories: 81 to 100 percent as very good, 61 to 80 percent as good, 41 to 60 percent as moderate, 21 to 40 percent as poor, and 0 to 20 percent as very poor.

The third instrument was a structured classroom-observation sheet designed to examine how teachers implemented the Merdeka Curriculum during instruction. Its indicators were organized into introductory, core, and closing activities. The introductory activities included orientation, motivation, and apperception. The core activities covered teachers' mastery of subject matter, student-centered instructional strategies, student participation, critical and creative thinking, communication, collaboration, classroom management, differentiated instruction, and the use of learning resources and technology. The closing activities included lesson summarization, reflection, assessment, feedback, and follow-up. The observation percentage was calculated by dividing the observed score by the maximum possible score and multiplying the result by 100. The same descriptive categories used for the understanding test and perception questionnaire were applied to the observation results.

The fourth instrument was a semi-structured interview guide used to obtain detailed explanations of teachers' understanding and implementation experiences. The questions addressed the preparation and review of teaching modules, interpretation of learning outcomes, selection of instructional models, student-centered learning, diagnostic assessment, differentiated instruction, formative and summative assessment, use of instructional media

and technology, professional-development experiences, and challenges encountered during curriculum implementation. Semi-structured interviews enabled the researcher to ask the same core questions of all participants while using follow-up questions to clarify relevant responses.

Data collection was conducted in four stages. First, the six participating teachers completed the 25-item curriculum-understanding test. Second, they independently completed the 15-item perception questionnaire. Third, classroom observations were conducted to document how the principles of the Merdeka Curriculum were enacted during the introductory, core, and closing stages of instruction. Field notes were used to record classroom events and contextual information that could not be adequately represented by numerical observation scores. Fourth, semi-structured interviews were conducted with each participant to clarify the test, questionnaire, and observation findings and to explore teachers' experiences of instructional planning and curriculum implementation. Where available, teaching modules prepared by the participating teachers were also examined to corroborate their descriptions of lesson planning.

Quantitative data from the understanding test, perception questionnaire, and classroom-observation sheet were analyzed using descriptive statistics, including individual scores, minimum and maximum scores, means, frequencies, and percentages. The mean understanding score was calculated by summing the scores of the six teachers and dividing the result by the number of participants. Questionnaire percentages were calculated for each item and dimension before the overall percentage was determined. Because the three dimensions contained different numbers of items, the overall perception percentage was calculated from the total score across all 15 items rather than from an unweighted mean of the three dimensional percentages. This procedure prevented dimensions containing fewer items from receiving disproportionate weight. All numerical calculations were rechecked against the raw data to ensure consistency among the tables, results, abstract, and conclusion.

The interview responses and observation notes were analyzed thematically by following the stages proposed by Braun and Clarke (2006): familiarization with the data, generation of initial codes, identification of potential themes, review of themes, definition and naming of themes, and preparation of the research report. The interview records and field notes were read repeatedly to obtain an overall understanding of the data. Relevant statements were then coded according to their meanings, and related codes were grouped into themes concerning curriculum understanding, perceptions, instructional planning, teaching-module development, student-centered instruction, differentiated learning, assessment practices, technology use, institutional support, and implementation challenges. Both deductive and inductive coding were employed. Deductive codes were derived from the research questions and principal components of the Merdeka Curriculum, while inductive codes were generated from recurring or unexpected patterns in the data. Representative interview excerpts were selected to support each theme. Differences among participants and evidence that did not conform to

dominant patterns were retained to avoid presenting the findings as uniformly positive.

The quantitative and qualitative findings were integrated during interpretation. Quantitative findings concerning teachers' understanding, perceptions, and classroom-observation scores were compared with the interview explanations, field notes, and available teaching documents. A comparison matrix was used to identify convergence, complementarity, and divergence among the findings. For example, high perception scores were compared with observed evidence of student-centered instruction, differentiated learning, assessment practices, and technology use. This integration was necessary because positive perceptions and high knowledge scores could not independently establish that the curriculum had been implemented consistently in classroom practice.

The credibility of the qualitative findings was strengthened through methodological triangulation involving tests, questionnaires, interviews, classroom observations, and available teaching documents. Comparisons at the participant level were conducted to determine whether teachers' interview statements were consistent with their observed practices. Member checking was used to confirm the accuracy of interview summaries and interpretations of key statements. An audit trail containing the instruments, field notes, coding decisions, data summaries, and calculation records was maintained to support the dependability and confirmability of the analysis. These procedures reflected the principles of credibility, transferability, dependability, and confirmability recommended for qualitative research (Korstjens & Moser, 2018). The quality of the quantitative analysis was supported by expert review of the instruments, consistent administration procedures, transparent scoring formulas, and verification of all calculations. The limited number of participants was explicitly acknowledged, and the quantitative findings were used to describe the investigated case rather than make population-level inferences.

Permission to conduct the study was obtained from the school administration before data collection. Participants received information about the study's objectives, procedures, voluntary nature, confidentiality protections, and intended use of the data. Informed consent was obtained before participation. The teachers were informed that they could decline to answer any question or withdraw from the study without academic or professional consequences. Personal names were replaced with participant codes, and the collected data were used exclusively for research purposes.

Results and Discussion

Results

The study was conducted from September 4 to October 23, 2024, at Sungai Raya 01 Public Elementary School. It examined three interconnected aspects of the implementation of the Merdeka Curriculum: teachers' understanding of the curriculum, their perceptions of its implementation, and their planning and enactment of classroom instruction. Data were collected from six classroom teachers, comprising three Grade I teachers and three

Grade IV teachers, through a 25-item understanding test, a 15-item perception questionnaire, semi-structured interviews, and classroom observations.

The teachers' understanding of the Merdeka Curriculum was measured using a 25-item multiple-choice test. Before administration, the instrument was reviewed for content and construct relevance by two certified teacher leaders. The test was administered to teachers from Classes I-A, I-B, I-C, IV-A, IV-B, and IV-C. The individual results are presented in Table 1.

Table 1. Teachers' Curriculum-Understanding Test Results

No.	Teacher's class	Score	Category
1	I-A	88	Very good
2	I-B	80	Good
3	I-C	84	Very good
4	IV-A	80	Good
5	IV-B	80	Good
6	IV-C	90	Very good
	Mean score	**83.67**	**Very good**

As shown in Table 1, the teachers' scores ranged from 80 to 90, with a mean of 83.67. Three teachers obtained scores categorized as very good, while the other three obtained scores categorized as good. The highest score was achieved by the Grade IV-C teacher, while the Grade I-B, Grade IV-A, and Grade IV-B teachers obtained the lowest score of 80. These findings indicate a limited but observable variation in curriculum understanding among the six participants. Because the test measured teachers' knowledge of the curriculum rather than their classroom performance, the scores were subsequently compared with the interview and observation findings.

The six teachers also completed a 15-item questionnaire measuring their perceptions of the Merdeka Curriculum. The questionnaire covered three dimensions: individual understanding of the perceived object, external stimuli received by the individual, and individual evaluation of the perceived object. The first dimension consisted of five items, the second consisted of four items, and the third consisted of six items. The raw scores and corrected percentages are presented in Table 2.

Table 2. Percentage Results of Teachers' Perceptions

No.	Indicator	Item	I-A	I-B	I-C	IV-A	IV-B	IV-C	Percentage
1	Individual understanding of the perceived object	1	4	4	4	4	4	4	80.00%
		2	4	4	4	4	4	4	80.00%
		3	4	4	5	4	5	4	86.67%
		4	4	5	5	4	4	4	86.67%
		5	4	4	4	4	4	4	80.00%
Mean percentage for individual understanding of the perceived object									**82.67%**
2	External stimuli received by the individual	6	5	4	5	4	5	5	93.33%
		7	4	5	4	5	4	5	90.00%
		8	5	4	5	5	4	5	93.33%
		9	5	4	5	5	5	5	96.67%

Mean percentage for external stimuli received by the individual									**93.33%**
3	Individual evaluation of the perceived object	10	4	4	5	4	5	4	86.67%
		11	4	4	4	4	4	4	80.00%
		12	4	4	5	4	5	4	86.67%
		13	4	4	4	4	4	4	80.00%
		14	4	4	4	4	4	4	80.00%
		15	4	4	4	4	4	4	80.00%
Mean percentage for individual evaluation of the perceived object									**82.22%**
Overall mean percentage of Grade I and Grade IV teachers' perceptions of the Merdeka Curriculum									**85.33%**

Table 2 shows that the dimension concerning individual understanding of the perceived object obtained a mean of 82.67%. The dimension concerning external stimuli received by the individual recorded the highest mean, at 93.33%. The dimension concerning individual evaluation of the perceived object obtained a mean of 82.22%. Across all 15 items and six respondents, the total score was 384 out of a maximum possible score of 450, resulting in an overall percentage of 85.33%. According to the predetermined classification criteria, this overall score was categorized as very good. Nevertheless, the variation across dimensions indicates that the teachers responded most positively to external curriculum-related information and stimuli, while their individual understanding and evaluation of the curriculum received comparatively lower scores.

The implementation of the Merdeka Curriculum was examined in relation to instructional planning and classroom enactment. In the interviews, all six teachers reported preparing teaching modules before conducting classroom instruction. They stated that the modules were reviewed by the principal before being approved for use. The teachers also reported that their instructional planning was intended to be student-centered. When preparing lessons, they considered the relevant learning outcomes, characteristics of the subject matter, and selection of instructional models.

The interview data also indicated that the teachers associated differentiated instruction with the use of diagnostic assessment. They explained that diagnostic assessment was intended to identify students' strengths and weaknesses and provide a basis for planning instruction according to students' characteristics. According to the teachers' accounts, this information enabled them to adjust instructional activities to students' learning needs and was expected to support more effective learning. These findings represent the teachers' reported planning practices. Their actual classroom enactment was examined separately through observation.

The classroom observations produced an overall implementation score of 94.60%, which was categorized as very good according to the scoring criteria used in the study. The observation findings were organized into introductory, core, and closing activities. During the introductory activities, the teachers conducted orientation, motivation, and apperception. They introduced the

learning material through relevant examples and connected new material with students' prior knowledge. These practices were observed to encourage students' initial participation and help them recognize the context of the lesson.

During the core activities, the teachers presented the learning material in a generally clear and systematic manner. The observed instructional methods included discussion, group work, and question-and-answer activities. Students participated in activities involving case analysis and problem solving, while group projects and presentations provided opportunities to practice communication, collaboration, creativity, and critical thinking. Positive teacher-student interactions and classroom management practices were also observed. The teachers used available learning resources, including the school library, the school environment, and printed materials. However, technology-based instruction was not observed during the classroom observations. The language used by the teachers was generally clear and appropriate to the classroom context.

During the closing activities, the teachers summarized the material, invited students to reflect on the lesson, conducted assessment, and provided follow-up activities. The summaries were used to revisit the main points of the lesson, while reflection provided students with opportunities to consider their understanding of the material. Assessment was conducted during or at the end of the learning process to identify students' levels of understanding. Overall, the observations documented the presence of the expected introductory, core, and closing activities, although the absence of observed technology integration represented a notable area for improvement.

The integrated findings revealed a generally consistent pattern among the test, questionnaire, interview, and observation results. The teachers obtained relatively high curriculum-understanding scores, reported positive perceptions of the Merdeka Curriculum, described planning practices that incorporated teaching modules and diagnostic assessment, and demonstrated most of the instructional practices included in the observation instrument. However, the findings also identified two qualifications. First, scores differed across teachers and perception dimensions, indicating that their understanding and evaluations were not completely uniform. Second, technology-based learning was not observed even though the teachers demonstrated other student-centered instructional practices. These findings suggest that implementation was broadly evident in the observed setting but remained uneven in particular areas.

Discussion

The first finding concerns the teachers' understanding of the Merdeka Curriculum. The mean test score of 83.67 indicates that the six Grade I and Grade IV teachers demonstrated a generally strong understanding of the curriculum content assessed by the instrument. The scores nevertheless ranged from 80 to 90, showing that curriculum knowledge was not identical across participants. This finding supports Arofaturrohman et al. (2023, p. 10255), who argue that a thorough understanding of the curriculum is necessary for teachers to design relevant learning and translate curriculum

expectations into instructional practices. However, the present result should not be interpreted as proof of comprehensive mastery because a 25-item test can measure only selected aspects of curriculum knowledge. Curriculum understanding is also demonstrated through teachers' interpretation of learning outcomes, selection of teaching strategies, assessment decisions, and responsiveness to classroom conditions.

The importance of examining curriculum knowledge together with classroom enactment is supported by research on educational reform. Teachers do not implement curriculum policy mechanically. Instead, they interpret new policy requirements through their prior knowledge, experiences, beliefs, and local working conditions. Datnow (2020) emphasizes that teachers' agency and professional capacity are central to the enactment of educational reform. In the present study, the relatively high understanding scores were broadly consistent with the interview and observation findings, particularly teachers' use of teaching modules, learning outcomes, student-centered activities, and diagnostic assessment. Nevertheless, the variation in scores and the absence of observed technology integration indicate that curriculum knowledge may be stronger in some areas than in others.

The second finding concerns teachers' perceptions of the Merdeka Curriculum. After correction of the item-level calculations, the overall percentage remained 85.33%, which was categorized as very good. The highest dimension was external stimuli received by the individual, at 93.33%, while individual understanding and individual evaluation obtained 82.67% and 82.22%, respectively. This pattern suggests that information, training, institutional communication, or other external curriculum-related stimuli were evaluated particularly positively. However, the comparatively lower scores for individual understanding and evaluation indicate that receiving positive external information does not necessarily produce an equally strong personal understanding or critical appraisal of the curriculum.

The generally positive perception is consistent with Rachmawati, as cited in Rahayuningsih and Hanif (2024, p. 2835), who states that teachers' perceptions of a curriculum may influence their motivation and commitment to its implementation. The finding should nevertheless be interpreted carefully. The present study did not statistically test whether perception scores predicted implementation quality, and the small number of participants does not support a causal conclusion. Positive perceptions can provide a favorable psychological foundation for reform, but curriculum implementation is also affected by professional knowledge, self-efficacy, experience, training, classroom size, resources, and school-level support. In an Indonesian primary-school context, Suprayogi et al. (2017) found that teachers' differentiated-instruction practices were associated with self-efficacy, constructivist beliefs, professional development, and classroom conditions. Thus, positive perceptions represent one supporting condition rather than sufficient evidence of successful implementation.

The interview findings indicate that the teachers prepared teaching modules and considered learning outcomes, subject-matter characteristics, instructional models, student-centered learning, and diagnostic assessment

during lesson planning. These practices correspond to the intended emphasis of the Merdeka Curriculum on flexible planning and responsiveness to students' learning needs. The principal's review of teaching modules also indicates the presence of school-level instructional supervision. This finding extends the argument of Sudjana, as cited in Rani and Mujianto (2023, p. 1535), that instructional approaches responsive to students' needs can strengthen their involvement and learning outcomes. However, because student achievement was not measured in this study, the present findings demonstrate teachers' reported planning intentions rather than evidence that these plans improved student outcomes.

The use of diagnostic assessment in planning differentiated instruction is particularly relevant. The teachers reported using diagnostic information to identify students' strengths and weaknesses and to design learning suited to their characteristics. This is consistent with differentiated instruction as an approach that modifies content, processes, learning activities, and support according to learner diversity. A systematic review and meta-analysis by Deunk et al. (2018) found that differentiation in primary education can produce positive effects when it is embedded in a coherent, learner-centered instructional approach. The same review also cautioned that grouping students by ability alone does not constitute effective differentiation. Therefore, the teachers' reported use of diagnostic assessment should be evaluated not only by whether students are classified into groups but also by whether assessment information leads to meaningful adjustments in content, instructional support, learning processes, and assessment.

The findings concerning assessment also require a distinction between conducting an assessment and using assessment evidence formatively. The teachers conducted assessment and reflection during the closing activities, but the available observation data do not fully demonstrate how assessment evidence was subsequently used to adapt teaching or provide targeted feedback. Heitink et al. (2016) explain that effective assessment for learning requires teachers to elicit evidence of student learning, interpret that evidence, provide focused feedback, involve students in the assessment process, and use the resulting information to make instructional decisions. Future implementation efforts at the school should therefore focus on documenting the complete cycle from diagnostic and formative assessment to instructional adjustment and follow-up.

The observation score of 94.60% indicates that most indicators included in the observation instrument were present during the observed lessons. Introductory activities included orientation, motivation, and connections with prior knowledge. Core activities included discussion, group work, questioning, case analysis, problem solving, projects, and presentations. Closing activities included summarization, reflection, assessment, and follow-up. These practices are consistent with Putri and Nukman's (2024, p. 116) argument that curriculum implementation depends not only on teachers' understanding but also on their capacity to develop interactive and responsive learning environments. The present observations suggest that the teachers enacted several student-centered elements, particularly through group interaction and

activities intended to stimulate communication, collaboration, creativity, and critical thinking.

Nevertheless, the high observation percentage should not be equated automatically with instructional effectiveness. The study did not measure changes in students' achievement, engagement, or longer-term competencies. Moreover, the observation score indicates whether predetermined practices were recorded, but it does not by itself establish their depth, quality, consistency, or appropriateness for individual students. A discussion may be present, for example, without ensuring equitable participation or conceptually meaningful interaction. Similarly, a group project may provide opportunities for collaboration without demonstrating that differentiated support was provided. The observation results therefore support the conclusion that the expected practices were broadly present during the observed lessons, but they do not justify a causal claim that the instruction improved student outcomes.

A notable divergence in the findings was the absence of observed technology-based learning. The teachers demonstrated positive curriculum perceptions and several student-centered practices, but the available observations did not show the pedagogical use of digital technology. This difference illustrates why self-reported understanding and perceptions should be compared with observable practice. Ertmer et al. (2012) found that technology integration is influenced by external conditions, such as access, institutional support, and training, as well as internal conditions, including teachers' confidence, knowledge, beliefs, and perceptions of the value of technology. The present study did not collect sufficient evidence to determine which of these factors explained the absence of technology use. It would therefore be inappropriate to attribute the finding exclusively to teachers' competence. Further investigation should examine the availability of devices and internet access, the relevance of digital resources, teachers' technological pedagogical knowledge, and the support available from school leadership.

The findings also point to the importance of sustained and context-specific professional development. All six teachers had participated in curriculum training, and their relatively high understanding and perception scores suggest that training and external information may have supported initial implementation. However, training participation does not guarantee consistent enactment in every aspect of classroom practice. A meta-analysis by Kahmann et al. (2022) found that professional-development programs on differentiated instruction had a moderate positive effect on teachers' knowledge, attitudes, and practices, with subject-specific programs producing stronger improvements in teaching practice. Accordingly, future professional development at Sungai Raya 01 Public Elementary School should move beyond general curriculum orientation and provide classroom-based coaching on differentiation, formative assessment, technology-supported learning, and the use of student evidence for instructional decision-making.

The integrated evidence suggests convergence in several areas. Teachers' test scores, perception responses, interview accounts, and observed practices consistently indicated a generally favorable orientation toward the Merdeka Curriculum. At the same time, the integration also revealed

qualifications that would have remained less visible if the study had relied on a single data source. Teachers differed in their understanding scores, perception dimensions were not equally strong, the use of assessment evidence was not fully documented, and technology integration was not observed. These qualifications indicate that implementation should be understood as a developing and multidimensional process rather than classified solely through a single overall category.

The findings are limited to six Grade I and Grade IV teachers at one public elementary school and cannot be statistically generalized to other schools. Questionnaire responses may have been affected by social-desirability bias, particularly because the participants were evaluating an official curriculum implemented in their workplace. Classroom behavior may also have been influenced by the presence of the observer. In addition, the study did not measure student outcomes and did not provide longitudinal evidence of whether the observed practices were sustained across subjects and semesters. Despite these limitations, the combination of tests, questionnaires, interviews, and observations provides contextual evidence that distinguishes teachers' knowledge and perceptions from their reported and observed classroom practices.

Overall, the study shows that implementation of the Merdeka Curriculum at Sungai Raya 01 Public Elementary School was broadly evident in teachers' curriculum understanding, perceptions, instructional planning, and observed classroom activities. Its contribution lies in demonstrating that these dimensions should be examined together rather than treated as equivalent. The findings also identify specific areas for continued improvement, particularly the formative use of assessment information, the depth of differentiated instruction, and the pedagogical integration of technology. These conclusions should be interpreted as evidence from a bounded school case rather than as proof of curriculum effectiveness across the wider primary-education system.

Conclusion

This study found that the implementation of the Merdeka Curriculum by Grade I and Grade IV teachers at Sungai Raya 01 Public Elementary School was reflected in several interconnected dimensions. The teachers obtained a mean curriculum-understanding score of 83.67 and an overall perception score of 85.33%, both categorized as very good. Classroom observations produced an implementation score of 94.60%, documenting the use of teaching modules, student-centered activities, differentiated-instruction planning, diagnostic assessment, group discussion, problem solving, reflection, and continuous assessment. More importantly, the integrated analysis revealed that external curriculum-related stimuli received the highest perception score, while teachers' individual understanding and evaluation received comparatively lower scores. Technology-based learning was also not observed. These findings challenge the assumption that positive perceptions and high knowledge scores necessarily indicate complete and consistent classroom implementation. Curriculum implementation should instead be

understood as a multidimensional and developing process involving alignment among teachers' knowledge, perceptions, planning, and enacted practices.

Scientifically, this study strengthens previous findings concerning the importance of teachers' curriculum understanding, positive perceptions, instructional planning, and professional capacity in educational reform. At the same time, it questions the validity of evaluating curriculum implementation solely through self-reported perceptions or a single overall score. By integrating test, questionnaire, interview, and observation evidence, the study introduces an analytical perspective that distinguishes between teachers' understanding of the curriculum, their responses to external curriculum information, their personal evaluation of the reform, and their actual classroom practices. This integrated perspective enriches discussions of Merdeka Curriculum implementation by demonstrating that apparent success at the aggregate level may coexist with specific areas requiring improvement, particularly the formative use of assessment evidence, the depth of differentiated instruction, and the pedagogical integration of technology.

This study was limited to six Grade I and Grade IV teachers at one public elementary school; therefore, its findings cannot be statistically generalized to other teachers, schools, or regions. Questionnaire responses may have been influenced by social-desirability bias, while classroom practices may have been affected by the presence of the observer. The study also did not measure student-learning outcomes or examine whether the observed practices were sustained across subjects and over a longer period. Further research should involve larger and more diverse samples, multiple schools, repeated classroom observations, longitudinal data, and direct measures of student learning. At the practical level, teachers should participate in sustained and classroom-based professional development focusing on differentiated instruction, formative assessment, and interactive technology-supported learning. School leaders should complement workshops with instructional coaching, peer observation, collaborative lesson planning, regular reviews of teaching modules, and adequate technological resources so that improvements in teachers' knowledge and perceptions can be translated into consistent and evidence-based classroom practices.

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