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IMPLEMENTATION OF THE MERDEKA CURRICULUM IN MATHEMATICS LEARNING AT MAN 2 KARANGANYAR IN THE 2025/2026 ACADEMIC YEAR

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Abstract

This research aims to describe the implementation of the Merdeka Curriculum in mathematics learning at MAN 2 Karanganyar for the 2025/2026 academic year, focusing on planning, implementation, facilities and infrastructure, challenges, and solutions undertaken by teachers and the madrasah. The research uses a descriptive qualitative approach with data collection techniques including observation, in-depth interviews with mathematics teachers, madrasah vice-principals, and students, as well as document study of the curriculum, teaching modules, and inventory of facilities and infrastructure. The research findings indicate that conceptually, the implementation of the Merdeka Curriculum has been successful thru planning based on the CP and ATP, the selection of essential materials, and the combination of direct instruction with varied activities such as interactive quizzes, discussions, and presentations. However, it is still constrained by students' low basic mathematical abilities, time limitations, and uneven digital infrastructure and laboratories. Teachers respond with differentiated instruction, an emphasis on essential materials, the use of available digital media, and flexible classroom management to maintain student understanding and learning motivation. The conclusion of the study indicates that mathematics learning at MAN 2 Karanganyar has led to a deep and contextual implementation of the Merdeka Curriculum, but still requires strengthening students' academic readiness and improving infrastructure to optimize the curriculum's goals.

1. INTRODUCTION

The Merdeka Curriculum demands significant transformation in teaching methods, especially in subjects with conceptual and problem-solving characteristics, such as Mathematics (Safari & Inayah, 2025). Mathematics, as the science underlying logic and critical reasoning, plays an important role in shaping students' analytical thinking skills, which are highly needed to face the challenges of the 21st century (Agustina, 2019). Therefore, the implementation of the Merdeka Curriculum in mathematics learning in secondary schools has become a necessary strategy to improve learning and the relevance of the knowledge provided to students (Rosa et al., 2024).

Mathematics learning is a learning process designed to equip students with the ability to think logically, critically, and systematically thru understanding mathematical concepts and problem-solving skills relevant to daily life (Witono & Hadi, 2025). This learning not only focuses on knowledge transfer but also emphasizes active student engagement thru discussion, exploration, and the application of concepts in real-world contexts (Artha et al., 2025). In the Merdeka Curriculum, mathematics learning emphasizes a student-centered learning approach, where the teacher acts as a facilitator guiding students to independently and collaboratively discover concepts and solutions (Kharismawati et al., 2025). This curriculum promotes flexible learning according to students' characteristics and needs, presenting enjoyable and meaningful learning experiences that can increase motivation and mathematics learning outcomes (Rosa et al., 2024).

The independent curriculum approach in mathematics learning prioritizes active, creative, and contextual methods (Asyha et al., 2025). Unlike the traditional approach, which emphasizes theory and thematic content, the Merdeka Curriculum gives teachers the freedom to implement innovative learning models such as discovery learning, project-based learning, and problem-solving (Alhayat et al., 2023). Students become active learners, thinking critically and creatively to solve mathematical problems that are relevant to everyday life (Haryanti & Yasin, 2024). This approach has been proven to improve conceptual understanding, problem-solving skills, as well as self-reliance and responsibility during the learning process (Aci Rahmawati & Neng Solihat, 2025). For example, project-based mathematics learning provides opportunities for students to learn theory thru real-world applications, thereby increasing their absorption and interest in learning (E. H. Ramadhan & Hindun, 2023). Madrasah Aliyah Negeri 2 Karanganyar is one of the leading schools in Central Java that has implemented the Merdeka Curriculum since the 2024/2025 academic year. This is evidenced by the outstanding achievements of its students, such as winning the general category at the Karanganyar District Level Madrasah Science Competition (KSM) in 2024, securing 3 first-place finishes in Biology, Geography, and Integrated Chemistry, as well as 1st-3rd place finishes in Integrated Mathematics and Physics. Additionally, the school won 4 medals at the 2023 Central Java & DIY Taekwondo Championship and participated in the National Science Olympiad. The high demand from students is reflected in the trend of quality madrasahs in the Solo Raya and Central Java regions, supported by improving educational quality as appreciated by the Central Java Ministry of Religious Affairs. The madrasah's flagship programs include intrakurricular skills thru Craft and Entrepreneurship for grades X-XII, covering fashion design (pattern making and design), culinary arts (culinary technology and food business), and graphic design (visual communication software), which enriches the holistic development of students' competencies.

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As an Islamic educational institution with A accreditation, MAN 2 Karanganyar not only emphasizes academic aspects but also character building and the holistic development of students' competencies. In this context, a thorough evaluation and study of the implementation of the Merdeka Curriculum is essential to understand its effectiveness in daily learning practices and to identify the challenges faced (Putri, 2024), including aspects of facilities and infrastructure as support for creating a conducive learning environment.

Some previous studies have shown that the implementation of the Merdeka Curriculum in various schools has a positive impact on increasing student motivation and participation (Marfu et al., 2025), as well as improving critical and creative thinking skills (Caesaria et al., 2024). However, on the other hand, some studies also note constraints such as limited infrastructure, teachers' readiness to adopt new teaching methods, and the need for continuous training, which means that curriculum implementation has not been able to run optimally and evenly (Nisa et al., 2023; T. Hasballah & Zulfatmi, 2024; Tarigan et al., 2025). Unlike those studies, which were general or focused on regular schools, this research specifically examines the implementation of the Merdeka Curriculum in Mathematics learning at MAN 2 Karanganyar for the 2025/2026 academic year, a school with A accreditation and Islamic characteristics. It uses a descriptive qualitative approach with source and technique triangulation to comprehensively explore curriculum aspects, teaching methods, and infrastructure.

Initial findings from this study indicate that, both theoretically and conceptually, the implementation of the Merdeka Curriculum at MAN 2 Karanganyar using a deep learning approach is generally running smoothly and does not face significant obstacles in terms of its concept or implementation framework. The school has successfully understood and applied the curriculum concept well. The novelty of this research lies in the in-depth study of specific physical and digital infrastructure limitations at MAN 2 Karanganyar in the 2025/2026 academic year, such as suboptimal classroom digitalization and laboratories requiring complete renovation, which have not been extensively explored in previous studies. This

research utilizes source and technique triangulation for stronger data validation within the context of Mathematics learning in A-accredited madrasas.

Although the implementation of the Merdeka Curriculum concept has been successful, a crucial issue centers on students' low basic readiness and abilities, particularly in mathematics learning from previous levels, as well as their characteristics of not being accustomed to active thinking and independent reasoning. This makes it difficult to apply strategies such as independent exploration and project-based learning. Additionally, the limited learning time to achieve semester goals while accommodating student adaptation, adjusting teacher strategies to real classroom conditions, and the limitations of physical and digital facilities (such as suboptimal classroom digitalization and laboratories needing complete renovation) are major obstacles in supporting modern learning methods, even tho the academic preparation of teachers and students has been met thru various trainings. Therefore, this research aims to provide an in-depth overview of the implementation of Mathematics learning strategies such as project-based learning, self- discovery, contextual problem-solving, and deep learning in accordance with the principles of the Merdeka Curriculum at MAN 2 Karanganyar, while also examining student readiness, infrastructure, and solutions to the challenges faced. This finding is important as material for evaluation and recommendations in developing education that is integrated and oriented toward students' character and competencies.

2. METHOD

The type of research used in this study is qualitative with a descriptive approach. This research aims to deeply describe how the Merdeka Curriculum is implemented in mathematics learning at MAN 2 Karanganyar in the 2025/2026 academic year. Data was collected thru observation (instrument: classroom and learning activity observation sheets), in-depth interviews (instrument: semi-structured interview guidelines with Mathematics teachers, vice-principals, and students), and document study (instrument: checklist for analyzing curriculum documents, teaching modules, and inventory of facilities and infrastructure).

The validity of the data in this study was established thru source triangulation and technique triangulation. This triangulation approach is used to ensure data validity by comparing information from various sources. Data analysis was conducted in stages, namely data reduction, data presentation, data verification, and drawing conclusions. Data reduction involved selecting and filtering relevant data, data presentation aimed to systematically organize the data, data verification was done to check consistency and accuracy, while drawing conclusions was the process of formulating the final research results based on the analyzed data. With this method, the research is expected to produce a comprehensive and accurate description of the mathematics learning process according to the principles of the Merdeka Curriculum at MAN 2 Karanganyar.

3. RESULTS AND DISCUSSION

Planning for the Implementation of the Merdeka Curriculum at MAN 2 Karanganyar

Planning for the implementation of the Merdeka Curriculum at MAN 2 Karanganyar began with the adaptation of Lesson Plans (RPP) based on Learning Outcomes (CP) and Learning Objectives Flow (ATP) for high school mathematics. Teachers designed essential materials with flexibility, considering local student conditions such as critical thinking readiness in Islamic-based madrasas. This approach aligns with the principles of the Merdeka Curriculum, which emphasizes differentiation based on student needs (Widiansyah et al., 2025).

Based on the interview with Ibu Halimah Ar Putri, S.Pd., a mathematics teacher at MAN 2 Karanganyar, she stated,

> "I design mathematics lessons while still referring to the Learning Outcomes (CP) in the Merdeka Curriculum. Next, I select truly

essential materials and then arrange the learning flow to suit the conditions and abilities of the students in the class."

The interview results describe an adaptive and student-centered learning approach, where he consistently refers to the Learning Outcomes (LO) in the Merdeka Curriculum as the main foundation. He selected only essential materials to avoid excessive workload, then designed a learning flow tailored to the conditions and abilities of the students in the class, making the learning process more relevant, effective, and contextual (Ananda et al., 2025). This approach aligns with the principles of the Merdeka Curriculum, which emphasizes teacher flexibility in adapting learning materials, reducing dense content, and differentiating instruction based on student needs to support post-pandemic learning recovery and the development of soft skills (I. Ramadhan, 2023).

Practically speaking, at MAN 2 Karanganyar, the dynamic adaptation strategy revealed by Ibu Halimah allows for deeper, more creative, and real-life-oriented mathematics learning, as seen in the school's flexible planning, which makes flexibility the main bridge toward the goals of the Merdeka Curriculum (Dwitami et al., 2025). He added,

"To accommodate students' needs, I supplement the lesson plans with graded exercises and quizzes. This allows me to monitor students' understanding and adjust the next steps in the learning process." In essence, my planning is made flexibly, adapting to the students' conditions while still being oriented toward the goals of the Merdeka Curriculum,"

The interview statement directly links the selection of essential materials with formative assessment to ensure optimal learning achievement. This approach is closely related to the principles of the Merdeka Curriculum, which promotes differentiated learning, thus supporting the implementation of project-based and contextual problem-solving in mathematics, where staged practice serves as a real-time evaluation tool to bridge students' understanding gaps toward core competencies (Wafi et al., 2025).

Implementation of the Merdeka Curriculum at MAN 2 Karanganyar

The implementation of the Merdeka Curriculum at MAN 2 Karanganyar not only depends on careful planning but also involves comprehensive team coordination from the initial stages, including the division of teaching duties, additional tasks, and daily monitoring of the learning process, assessment, and classroom and teacher administration (Herawati & Supriyana, 2024). This process ensures that the principles of flexibility and student-centeredness in the Merdeka Curriculum can be sustainably realized in A-accredited madrasah environments like MAN 2 Karanganyar, with the support of adaptive infrastructure despite limitations (Amaliyah et al., 2025). This aligns with Ibu Amini's experience as part of the implementation team, as stated in the interview:

"I was involved from the beginning in the implementation of the Merdeka Curriculum, starting from the curriculum development stage itself. We have formed a special team, and I am part of it. This team is responsible for designing the curriculum comprehensively, researching appropriate curriculum models, and determining the division of implementation tasks, including teaching duties and other additional responsibilities. Additionally, we conduct daily monitoring of the learning process, evaluate learning outcomes assessments, and oversee administration at both the classroom level and overall teacher administration."

This daily monitoring and strict assessment serve as the foundation for teachers to enrich the implementation of innovative learning thru formative assessments, such as interactive quizzes that monitor student understanding in real-time (Pakudu, 2024). This approach allows for

subsequent instructional adjustments with a high degree of precision, enabling the optimization of classroom rhythm to maintain each student's active engagement toward deep understanding (Nuqia et al., 2025). This flexibility reflects the essence of the Merdeka Curriculum, where teachers are not limited to a single model but rather integrate diverse strategies according to the students' context (Inayah & Noor, 2025).

Based on the interview with Ibu Halimah Ar Putri, S.Pd., a mathematics teacher at MAN 2 Karanganyar, she emphasized:

> "In its implementation, there is no compulsion to use only one learning model. Strengthening mathematical concepts still heavily relies on direct instruction to prevent confusion and allow students to follow the material sequentially."

This strategy maintains the stability of basic understanding, avoiding student confusion when grasping complex concepts like linear algebra or transformation geometry, as if building a solid staircase to the peak of knowledge.

The balance between robust direct instruction and adaptive differentiation becomes an intelligent blend, ensuring students follow the material sequentially without hindrance (Cahyani et al., 2025). This visionary approach brings to life the golden foundation of the Merdeka Curriculum, fostering students' confidence to overcome the challenges they face in learning mathematics (Anggreini & Priyojadmiko, 2022).

This implementation aligns with achieving the independent and creative Pancasila Student Profile, where students not only master concepts but also learn to think critically thru instant feedback from student assessments by designing unique geometry projects for the local community (Nuraeni et al., 2025). As a result, the classroom transformed into a dynamic learning ecosystem that supports the potential of each individual (Lazwardi et al., 2025).

Facilities and Infrastructure Supporting the Independent Curriculum at MAN 2 Karanganyar

The facilities and infrastructure supporting the Independent Curriculum at MAN 2 Karanganyar still face significant limitations, as stated by Ibu Amini in an interview. He stated,

> "At MAN 2 Karanganyar, the facilities still have significant shortcomings. In the classroom, digitalization facilities are not yet optimal. Additionally, the laboratory and other supporting facilities also need improvement. Overall, the facilities need to be improved, both those related to the teaching and learning process in the classroom and other supporting facilities."

This statement underscores the urgency of improving infrastructure to support project-based learning and deep learning in the Merdeka Curriculum, where digital facilities and laboratories are crucial elements for visualizing abstract mathematical concepts (Wahyuni & Hasanuddin, 2025).

The use of existing facilities such as LCD projectors and whiteboards continues to be effectively integrated into mathematics learning, as stated by the mathematics teacher:

> "In daily lessons, the LCD projector facility is still used, although not in every meeting. LCDs are typically used to display material at the beginning of lessons, example questions, or occasionally for quizzes and visualizations so that students gain a clear initial understanding,"

This interview statement aligns with the principles of the Merdeka Curriculum thru visual-based and differentiated learning approaches (Sastafiana et al., 2024). Limitations such as the uneven distribution of Smart TVs and LCDs are overcome thru creative adaptations, such as switching to dominant whiteboards or sharing materials via WhatsApp, ensuring learning remains inclusive and flexible without relying on advanced infrastructure.

The teacher also emphasized the effectiveness of the blackboard, stating,

"The most helpful facilities in

mathematics learning based on the Merdeka Curriculum are the blackboard and writing materials, because both are almost always used in every meeting."

This allows for a gradual pacing of explanations to support the Pancasila Student Profile. Students' perspectives further enrich this picture of limitations, with Alifah stating,

> "Smart TV facilities are available in 10th grade, but not in 11th and 12th grades. Ideally, these facilities should be available in all grades."

Juniar added,

> "Learning facilities here are still inadequate, especially since we only rely on Smart TVs, which are not available in all classrooms. Additionally, compared to previous schools at the elementary and junior high levels, where students were provided with computer access in the library or laboratory, the current conditions do not offer similar facilities. As a result, the search for alternative learning resources often becomes less rapid."

Meanwhile, the third student, Devia, also complained,

> "The computer lab facilities haven't been fully utilized, while the chemistry lab that was previously used is no longer operational."

Infrastructure inequality remains a major challenge for many schools in Indonesia (Mawaddah et al., 2024), including uneven classroom digitalization and the need for laboratory improvements. This is a shared challenge for school management, teachers, and students, yet it has spurred creative adaptations such as using WhatsApp as a bridge for accessing materials (Mulyanti & Nurhayati, 2025). This approach not only maintains the momentum of the Merdeka Curriculum at MAN 2 Karanganyar but also emphasizes the potential for optimizing public school infrastructure thru community-based strategies and phased budget allocation.

Challenges in Implementing the Merdeka Curriculum at MAN 2 Karanganyar

The implementation of the Merdeka Curriculum at MAN 2 Karanganyar faces a major challenge in the basic readiness and abilities of students in mathematics. Based on interviews with Ibu Halimah Ar Putri, S.Pd., the mathematics teacher, she stated,

> "The main challenge in implementing the Merdeka Curriculum lies in the readiness and basic abilities of the students. At MAN 2 Karanganyar, students' basic mathematical abilities from previous levels are still low, making it difficult to optimally implement the curriculum's demands to encourage reasoning independence and self-directed learning."

This aligns with the finding that the Merdeka Curriculum emphasizes project-based and differentiated learning, which requires a strong foundation for students (Wijayati et al., 2025). As revealed in recent studies, students' gaps in basic literacy and numeracy are a major constraint in advancing mathematical abilities in the era of the Merdeka Curriculum (Rosadi et al., 2025).

Characteristics of students who are not yet accustomed to active thinking also pose a significant obstacle in mathematics learning (Cahyaningsih & Ghufron, 2016). The teacher added,

> "In addition, the characteristics of students who were not yet accustomed to active thinking at the beginning of learning became one of the main obstacles. The direct application of a learning model that demands independent exploration actually causes many students to feel confused and not understand the direction of the learning."

This condition makes it difficult to implement elements of the Merdeka Curriculum such as the Pancasila Student Profile, which requires independence, as discussed in similar studies on curriculum transitions in secondary schools.

Limited learning time further exacerbates students' adaptation to the new pattern of the Merdeka Curriculum (Supriyadi et al., 2026). Teacher interviews revealed,

> "Another challenge arises from the limited learning time, where learning outcomes still need to be achieved within one semester, while the process of students adapting to the Merdeka Curriculum learning pattern requires a considerable amount of time."

This factor is often found in the flexible implementation of the Merdeka Curriculum, where time allocation pressures hinder in-depth exploration of STEM subjects like mathematics (Fakhrudin et al., 2023). As shown by other research, this interdisciplinary STEM approach requires additional time for its projects, often conflicting with the busy schedule of the Merdeka Curriculum, which actually motivates teachers to innovate in time management (Yatim et al., 2024).

From the teacher's perspective, adapting learning strategies becomes a challenge in the midst of real classroom conditions. He also stated,

> "Adapting learning strategies is also a challenge, as not all approaches in the Merdeka Curriculum can be applied ideally and require adaptation to the real conditions in the classroom."

Research shows that intensive teacher training is needed to overcome this resistance in the Merdeka Curriculum (Umami & Wahyudi, 2025).

This challenge is increasingly felt from the students' perspective, especially regarding financial burden and adapting to new elements like the Pancasila Student Profile Strengthening Project (P5). For example, Juniar stated,

> “The difficulty is very noticeable in class X, especially because there is still the Pancasila Student Profile Strengthening Project (P5RA). In class XI, there has been no P5 this semester because the program has been discontinued. However, difficulties during the implementation of the Merdeka Curriculum primarily arise during the execution of the P5 project, where students are required to invest a significant amount of capital.”

This statement confirms the limitations of students' basic abilities, where the P5 project, which demands independent exploration, actually burdens them financially and adds to the initial confusion of adaptation.

Similarly, Devia emphasized the pressure of the new program and budget, saying,

> “It's a bit difficult because there are many new things, unlike the previous curriculum which was more relaxed and had minimal programs like TKA and P5. Especially P5 requires a large budget for students and tasks with short deadlines that often cause confusion.”

This aligns with teachers' complaints about limited time and the need to adjust strategies, as intensive programs like P5 and TKA accelerate the confusion of students who are not yet ready for active reasoning. However, time constraints often impact the quality of the final results (Astuti et al., 2024), thus requiring a gradual approach to building independence.

Meanwhile, Alifah saw the transition as positive despite initial confusion, stating,

> "Previously, we implemented the Unit Level Curriculum (K13), so it was a bit confusing when we switched to the context-rich Merdeka Curriculum."

The Merdeka Curriculum is more in-depth and efficient because it emphasizes direct, exemplary, and applicable practices, unlike the previous curriculum which focused on limited theory and materials. This view complements the teacher's perspective, where although the theory-oriented characteristics of students are a barrier, the contextual practice approach of the Merdeka Curriculum has the potential to be more efficient if supported by a better basic understanding and time adjustments (Purwandari et al., 2024), thus enriching the overall evaluation of challenges

at MAN 2 Karanganyar.

Implementation Solutions for the Merdeka Curriculum at MAN 2 Karanganyar

Teachers at MAN 2 Karanganyar are implementing a flexible approach to address students' limited understanding of basic mathematical concepts in the Merdeka Curriculum, prioritizing direct instruction on core material before introducing varied activities (Sugesti et al., 2020). From the interview results, he stated,

> "The way to overcome this is by adjusting the approach to the real conditions of the students in the class. Not all learning models from the Merdeka Curriculum are fully implemented. For core material, direct instruction is still predominantly used to ensure students truly understand the basic concepts."

This strategy aligns with the principles of the Merdeka Curriculum, which emphasizes differentiated learning based on students' abilities.

Teachers fill lessons with interactive elements like quizzes or game-based exercises to maintain student motivation, making the classroom atmosphere more lively without sacrificing conceptual understanding (Azzahra et al., 2025). He also added,

> "After that, the activity began with a gradual approach, followed by variations such as quizzes or interactive game-based exercises to liven up the classroom atmosphere and maintain student interest. This approach emphasizes a deep understanding of students to avoid confusion, while ensuring learning targets are achieved."

This phased approach supports the achievement of the Pancasila Student Profile in the Merdeka Curriculum thru the flexibility of learning models.

Regarding time constraints, the solution implemented was to focus the discussion on essential material according to learning outcomes, with strict time management and an emphasis on representative exercises (Muna, 2024). She explained,

> "To overcome the limitations of learning time, the main focus was given to essential material according to learning outcomes, so not all topics were discussed in detail in class. Time management is strictly enforced, with concise and focused explanations, followed by practice questions or in-depth study that best represent the core concepts."

This time optimization allows for the effective implementation of the Merdeka Curriculum despite limited class hours (Wahidah et al., 2024).

This holistic approach not only ensures learning objectives are met but also adapts to the characteristics of MAN 2 Karanganyar students thru efficient interactive quiz formats (Ilham & Achmad, 2017). He concluded with the statement,

> "Sometimes the training is packaged thru interactive quizzes to speed up the process, but it still provides an overview of the students' understanding. In essence, time is utilized as effectively as possible by adjusting to the students' conditions and the target material that needs to be completed."

This solution strengthens the adaptation of the Merdeka Curriculum in the local context.

This solution is further enriched by the utilization of digital facilities such as Smart TVs, which support faster and more comprehensive understanding of the material, going beyond reliance on textbooks alone (Sundari & Etiyaningsih, 2025). This aligns with Juniar's student interview, which stated,

> "To better understand the subject matter, the assistance of facilities like Smart TVs is needed. Using Smart TVs allows for faster access to information and the search for additional resources beyond textbooks. Books remain relevant, but other sources are also essential."

The teacher's approach to integrating this technology complements their flexible strategies, allowing students to explore

diverse learning resources to reinforce basic mathematical concepts (Puteri et al., 2025).

The use of electronic media such as Smart TVs makes the explanation of material more detailed, concise, and includes attractive visual examples, making learning under the Merdeka Curriculum feel more lively and easier to understand (Fitria & Muthi, 2024). In her interview, Devi affirmed,

> "Using Smart TVs or other electronic media is more effective because the material is presented concisely and is easy to understand, similar to the comfortable experience of watching modern TV. Such media is also more comprehensive, including various examples and supporting images, making the explanations clearer and more engaging."

This integration not only supports teachers' interactive quizzes but also enriches learning differentiation with visual elements relevant to students at MAN 2 Karanganyar. Additionally, the varied activities implemented by the teacher, such as group discussions and presentations, align with students' experiences, creating a collaborative and supportive classroom dynamic that aligns with the Pancasila Student Profile (Puspita & Riska, 2025). Alifah shared her experience,

> "Usually, we are given material to read, followed by group discussions and presentations. The Merdeka Curriculum also emphasizes many presentations, followed by a question-and-answer session between groups."

The teachers' phased strategy from direct learning to inter-group presentations helps overcome limitations in student readiness, making the implementation of the Merdeka Curriculum more inclusive and effective at MAN 2 Karanganyar (Nafilata et al., 2025).

Evaluation of the Implementation of the Merdeka Curriculum at MAN 2 Karanganyar

The evaluation of the implementation of the Merdeka Curriculum at MAN 2 Karanganyar was conducted thru a series of structured mechanisms, including the madrasah self-evaluation (MSE) at the beginning of the academic year and end-of-semester assessments to comprehensively measure learning outcomes (Kurniawan et al., 2025). According to Ibu Amini,

> "The evaluation process is enriched by madrasah exams as a benchmark for student learning achievement, in addition to the Computer-Based National Assessment (ANBK), which serves as a complete madrasah report, reflecting the overall quality of learning, infrastructure, and the learning environment."

This ANBK serves as the main reference for schools to evaluate learning achievement at MAN 2 Karanganyar, thus providing a holistic picture of the effectiveness of curriculum implementation (Kurniawan et al., 2025). Where all stages of preparation, implementation, and post-implementation of ANBK are managed independently by the madrasah itself to strengthen the commitment and evaluation of national management (Berlianto & Pembangunan, 2023).

At the level of mathematics learning, evaluation adopts a flexible and varied approach depending on the material and classroom dynamics. Based on the interview with Ibu Halimah, a mathematics teacher at MAN 2 Karanganyar, she stated,

> "The evaluation of mathematics learning in the Merdeka Curriculum is adjusted to the material and classroom conditions, so it is not limited to just one method. Written tests or board exercises are often used to directly observe students' thinking processes, from the steps taken to the final results. On another occasion, gamification applications were used for quizzes or light evaluations, which created a more relaxed and enthusiastic classroom atmosphere while still measuring concept understanding. This approach is made varied and flexible to accurately reflect the achievement of mathematics learning targets."

This variation in evaluation methods aligns

with the curriculum principle that emphasizes teacher flexibility in describing student progress (Maharani et al., 2025).

However, student feedback highlighted crucial areas for improvement to strengthen future evaluations, with Juniar's interview results stating,

> "Learning needs to be improved, especially by enhancing teacher quality. Additionally, school facilities such as bathroom cleanliness and others also need more attention."

This emphasizes improving teacher quality and facilities as top priorities. Devia added a suggestion to improve facilitation for students, particularly providing more detailed and easier-to-understand explanations of mathematics for students who are less academically inclined, as she stated:

> "Facilities for younger students need to be increased so they don't fall behind. Subjects should also be explained in more detail so they are easy for students who don't enjoy academic fields to understand."

Meanwhile, Alifah appreciated the progress made but requested improved facilities considering the large number of students, stating:

> "The current conditions are good, but they can still be improved because the large number of students is not yet balanced with the adequacy of the facilities."

Integrating student input with ANBK findings and teacher evaluations can serve as the basis for strategic recommendations, ensuring that the implementation of the Merdeka Curriculum at MAN 2 Karanganyar becomes increasingly inclusive and sustainable. Integrating student input with ANBK findings and teacher evaluations can serve as the basis for strategic recommendations, ensuring that the implementation of the Merdeka Curriculum at MAN 2 Karanganyar becomes increasingly inclusive and sustainable.

4. CONCLUSION

Based on the research findings, it can be concluded that the implementation of the Merdeka Curriculum in mathematics learning at MAN 2 Karanganyar for the 2025/2026 academic year has conceptually been well-executed, as evidenced by planning that refers to the CP and ATP, the selection of essential materials, and the active role of the curriculum team and teachers in designing, implementing, and evaluating learning flexibly. The math teacher combines direct instruction with varied activities such as interactive quizzes and discussions, ensuring that students can still grasp the basic concepts even with their diverse initial abilities. This aligns with the researcher's observation results, which indicate that the learning process in the classroom has already adopted student-centered principles, differentiation, and the use of learning media tailored to the real conditions of the madrasah.

These findings address the expectations outlined in the Introduction, namely to provide an in-depth overview of the implementation of mathematics learning strategies (project-based learning, self-discovery, contextual problem-solving, deep learning), student readiness, facilities and infrastructure, as well as solutions to the challenges faced, thereby resulting in a consistent and complementary Results and Discussion chapter. On the other hand, the effectiveness of implementation remains limited by students' low foundational mathematics skills from previous grade levels, their passive learning styles, limited instructional time, and suboptimal digital infrastructure (uneven distribution of Smart TVs and LCDs) and laboratories; solution strategies such as focusing on essential content, utilizing available electronic media, interactive quizzes, and flexible classroom management have successfully mitigated these barriers, though not entirely.

Overall, mathematics instruction at MAN 2 Karanganyar has resulted in a deep, contextual, and adaptive implementation of the Merdeka Curriculum, as evidenced by data triangulation from observation results, interviews with teachers (Ms. Halimah, Ms. Amini), students (Alifah, Juniar, Devia), and document analysis. Prospects for

development include intensive training on basic mathematics readiness for new students, optimization of digital infrastructure through madrasah budgets and partnerships, and further quantitative studies (e.g., long-term ANBK impact assessments) to apply these findings to a more mature implementation of the Merdeka Curriculum in A-accredited madrasahs.

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