JOURNAL OF INNOVATION AND RESEARCH IN PRIMARY EDUCATION | ISSN 2829-775X
Vol. 4, No. 3, 2025, 856-865
https://doi.org/10.56916/jirpe.v4i3.1453

Critical Thinking Skills in Mathematics Learning through a Differentiated Learning Approach in the Era of Independent Curriculum: Systematic Literature Review

Ririn Noviyanti *
Department of Master's Basic Education, State University of Surabaya, Indonesia

Wiryanto
Department of Master's Basic Education, State University of Surabaya, Indonesia

Neni Mariana
Department of Master's Basic Education, State University of Surabaya, Indonesia

***Corresponding Author:** ririn.23044@mhs.unesa.ac.id

Keywords
Differentiated Instruction
Critical Thinking
Merdeka Curriculum
Mathematics Education
Systematic Literature Review

Article History
Received yyyy-mm-dd
Accepted yyyy-mm-dd

Abstract
This study aims to explore the integration of differentiated instruction and the development of students' critical thinking skills within the context of the Merdeka Curriculum (Independent Curriculum) in elementary mathematics education. Employing a Systematic Literature Review (SLR) method, this research analyzed 8 peer-reviewed journal articles published between [insert year range]. The findings reveal that differentiated instruction through content, process, product, and learning environment adjustments significantly contributes to enhancing students' critical thinking skills, including analysis, evaluation, inference, and problem-solving abilities. Differentiation enables learning personalization based on students' readiness, interests, and learning profiles, thereby creating equitable and inclusive learning environments. The implementation of differentiated learning media, such as digital worksheets and interactive e-modules, further supports student engagement and cognitive development. However, several challenges persist, including teachers' limited competence in differentiation strategies, time constraints, and the demands of managing heterogeneous classrooms. Despite these challenges, differentiated instruction aligns with the principles of the Merdeka Curriculum, which emphasizes student agency, diversity, and the cultivation of 21st-century competencies. The review also highlights the crucial role of teacher training, curriculum support systems, and innovative teaching practices in optimizing the implementation of differentiation in mathematics instruction. This study recommends the institutionalization of professional development programs, the design of adaptive learning media, and further empirical research on the long-term impact of differentiation on students' cognitive and character development. In addition, specific statistical results from the reviewed articles (e.g., effect sizes, sample characteristics) should be integrated where available to strengthen the synthesis. The integration of differentiated instruction and critical thinking within the Merdeka Curriculum represents a transformative shift toward inclusive, student-centered mathematics education in Indonesian elementary schools.

INTRODUCTION

Math learning in the 21st century faces a major challenge in preparing students with high-level thinking skills. One of the most essential skills is critical thinking, which allows students to analyze, evaluate, and solve problems logically and systematically. These skills are at the core of the global competencies needed in facing the dynamics of the industrial revolution 4.0 era (Hanipah, 2023). Globally, studies by OECD (2019) show that Indonesian students lag behind in mathematical reasoning and problem-solving when compared to other countries, such as Singapore, Japan, and Finland. However, the reality on the ground shows that many students at the elementary to secondary school level still have difficulty in demonstrating critical thinking skills in the context of mathematics (Mariana, 2025). This difficulty can be seen in the weak ability of students to interpret problems, make problem-solving strategies, and evaluate their own work. In fact, mathematics as a logical subject should be an ideal forum to develop critical thinking skills from an early age. This condition shows that there is a gap between the demands of the 21st century curriculum and the learning

practices that take place in the classroom. Therefore, a learning approach is needed that is able to bridge these gaps effectively and contextually.

One of the approaches that emerges in the Independent Curriculum is differentiated learning, which is a teaching strategy that focuses on the individual learning needs of students. This approach provides space for teachers to adjust learning materials, processes, and products according to students' readiness, interests, and learning profiles (Lema, 2023). In the context of the Independent Curriculum, differentiated learning is one of the main principles for creating learning that is in favor of students (Shihab et al., 2023). This is considered a response to the diversity of student backgrounds and learning styles in increasingly heterogeneous classrooms. With this approach, students are no longer treated uniformly, but as unique individuals with different potentials that need to be developed optimally. Through differentiated learning, it is hoped that students can be more active, feel valued, and encouraged to think more critically in the learning process. In addition, this approach provides an opportunity for teachers to use a variety of innovative strategies that are more adaptive to the characteristics of students. Therefore, differentiated approaches need to be explored further in conjunction with the development of critical thinking skills in mathematics.

The Merdeka curriculum itself is a transformation from the previous curriculum which emphasized flexibility, post-pandemic learning recovery, and strengthening students' essential competencies. This curriculum encourages teachers to apply meaningful, contextual, and adaptive learning to social change and technological developments (Ministry of Education and Culture, 2022). In it, differentiated learning is present as an implementable strategy that helps students achieve personal and progressive competence. However, the success of this approach is highly dependent on teachers' understanding and the readiness of the education system to support its implementation. This is because differentiated learning is not just a variation of methods, but requires careful planning, diagnostic assessment, and teachers' skills in managing class diversity (Hafana et al., 2024). With a good understanding, teachers can design math learning that not only conveys the material, but also stimulates students' critical thinking skills. This is consistent with socio-constructivist perspectives which emphasize the role of student-centered and interactive learning environments. However, incorporating additional theoretical lenses such as multiple intelligences, Universal Design for Learning, and culturally responsive pedagogy may further enrich the framework for differentiation. This is an important step to overcome the low critical thinking ability which has been a chronic problem at various levels of education. Therefore, further studies are urgently needed to find out how this approach is effectively applied in mathematics learning.

Some recent research shows that the application of differentiated learning can contribute positively to improving students' critical thinking skills. A study by Wahyuni (2022) found that a differentiated approach combined with project-based learning was able to improve students' analytical and evaluation skills in solving math problems. Similarly, the combination with the STEM (Science, Technology, Engineering, and Mathematics) approach also significantly strengthens students' reflective thinking and problem-solving abilities (Furner & Duffy, 2022). This approach encourages students to relate mathematical concepts to real phenomena, thus better understanding the meaning and benefits of learning. In addition, differentiated learning provides space for students to communicate ideas and solutions independently, which ultimately strengthens their confidence and learning independence. However, these positive results are still case-by-case and have not been comprehensively researched in the context of the Independent Curriculum. Therefore, a systematic study is needed that can summarize these findings in an integrated manner. This study is important as a basis for decision-making in designing more contextual and effective learning strategies.

The Systematic Literature Review (SLR) method is the right approach to collect, evaluate, and synthesize various relevant research in a systematic and structured manner. With this approach, researchers can identify patterns, strengths, and limitations of previous research on critical thinking skills in mathematics learning through a differentiated approach. SLR also makes it possible to construct a conceptual framework and find research gaps that are still open to explore (Höfrová et al.,

2024). Especially in the context of the Independent Curriculum which has been relatively recently implemented nationally, this study is important to understand the extent to which the differentiation approach has had an impact on mathematics learning. In addition, SLR can be a strong theoretical basis for teachers, researchers, and policymakers in formulating targeted learning strategies. Through this method, the findings obtained are not only descriptive, but also analytical and reflective of learning practices in Indonesia. Thus, the use of SLR in this study is expected to make a significant academic contribution to the development of competency-based mathematics education in the 21st century. This is becoming increasingly crucial in the midst of the urgent need for inclusive and adaptive learning to the changing times.

Based on this exposure, it can be concluded that differentiated learning in the Independent Curriculum has great potential in improving students' critical thinking skills in mathematics. However, its effectiveness still requires further mapping through a systematic review of the available literature. Therefore, this study aims to conduct a Systematic Literature Review of studies that examine critical thinking skills in mathematics learning with a differentiated approach in the context of the Independent Curriculum. The focus of this research is to identify the most effective strategies, the obstacles faced, and the contribution of differentiated learning to strengthening students' critical thinking skills. In addition, this study also seeks to develop a conceptual framework that can be used in the development of more meaningful and contextual mathematics learning. With the hope, the results of this research can contribute to teachers, researchers, and policy makers in designing learning strategies that are relevant to the needs of the times. This research is also expected to strengthen the theoretical foundation for the implementation of the Independent Curriculum more broadly and deeply. Therefore, this research is an important first step in supporting the transformation of national education that is oriented towards strengthening the character and essential competencies of students.

METHODS

This study uses the Systematic Literature Review (SLR) approach to examine critical thinking skills in mathematics learning through a differentiated learning approach in the era of the Independent Curriculum. The SLR approach was chosen because it is able to systematically compile evidence from various scientific sources to produce a valid and accountable synthesis. The SLR process in this study refers to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) protocol which consists of four stages: identification, selection, feasibility, and inclusion. The researcher sets the inclusion criteria in the form of articles from accredited national journals or reputable international journals published between 2020 and 2025. The focus of the article should be related to mathematics learning, critical thinking, differentiated learning, and the implementation of the Independent Curriculum. To ensure comprehensiveness, a detailed search strategy was employed using Boolean operators and keyword combinations such as: ("critical thinking" AND "mathematics") AND ("differentiated learning" OR "differentiated instruction") AND ("Merdeka Curriculum" OR "Independent Curriculum"). The article search process is carried out through databases such as Google Scholar, Garuda Ristek-BRIN, ERIC, and Scopus, ensuring a wider range of accessible and peer-reviewed sources. The quality of the articles obtained was then reviewed based on the relevance of the topic, the clarity of the methodology, and the contribution to the development of education.

After the selected articles are collected, the next stage is to conduct content analysis to identify thematic patterns and key findings related to critical thinking skills and differentiated learning strategies. This analysis aims to group learning approaches that have proven to be effective in improving students' critical thinking skills. In addition, the researcher also noted the supporting and inhibiting factors in the implementation of differentiated learning in the context of the Independent Curriculum. Each article was analyzed using a literature review matrix that included the identity of the article, the research objectives, methodology, results, and implications. Using this approach,

researchers can map the contribution of each article to the strengthening of mathematics education theory and practice. The results of the analysis were then synthesized to formulate a conceptual framework that described the relationship between the main variables in the study. This framework is expected to be the basis for the development of a more contextual and adaptive mathematics learning model.

The validity of the study results is maintained through the validation process between researchers (peer checking) and its traceability is strengthened by systematic recording of the entire article selection and analysis process. The researcher used the Mendeley application to manage references and make it easier to record library sources during the SLR process. To ensure objectivity, two independent researchers conducted a cross-review of the list of selected articles. Any discrepancies in the article selection and assessment process are resolved through discussion and consensus. The results of this systematics are presented in the form of narrative and visualization of PRISMA flowcharts. This research not only produces a synthesis of previous results, but also provides practical and theoretical recommendations based on the findings. With this method, research is expected to be able to contribute to strengthening the quality of mathematics learning in the current Indonesian education context.

RESULTS AND DISCUSSION

Research Results

Table 1 presents a summary of recent studies investigating the implementation of differentiated instruction and its impact on critical thinking skills within the framework of the Merdeka Curriculum.

Table 1. Summary of Research Findings on Differentiated Instruction and Critical Thinking Skills in the Merdeka Curriculum

Researcher(s) (Year)	Topic	Research Method	Key Findings
(Fauzia & Ramadan, 2023)	Implementation of Differentiated Instruction in the Merdeka Curriculum	Qualitative Study	Differentiated instruction increases student motivation and engagement in learning mathematics.
(Wahyuni, 2023)	The Effect of Differentiated Strategies on Students' Critical Thinking Skills	Quasi-Experimental	Students exposed to differentiated instruction showed significant improvement in critical thinking skills.
(Mufliva et al., 2023)	Design of Differentiated Student Worksheets (LKPD) for Mathematics in Elementary Schools	Developmental Research	Differentiated LKPDs are effective in improving conceptual understanding and allowing students to explore.
(Kriswanto & Fauzi, 2023)	Learning Styles and Product Differentiation in Mathematics Learning	Descriptive Study	Differentiated approaches accommodate learning styles and significantly improve student learning outcomes.
(Rofi'ah et al., 2024)	Teachers' Readiness to Implement the Merdeka Curriculum with Differentiated Strategies	Survey	Many teachers require training to effectively implement differentiated instruction.
(Fahma & Bintoro, 2024)	Differentiated and Technology-Based E-Modules for Mathematics	Research and Development	Constructivist-based differentiated e-modules are effective in enhancing learning outcomes and critical thinking.
(Muthaharoh et al., 2024)	Challenges and Solutions for Differentiated Instruction in the Merdeka Curriculum	Qualitative Study	Main challenges include time constraints, class size, and teacher competence, which can be addressed through policy support.
(Hardianti et al., 2025)	Pancasila Student Profile Values in Differentiated Mathematics Learning	Case Study	Differentiated instruction strengthens student character and competencies such as collaboration and critical reasoning.

General Profile of the Reviewed Studies

The reviewed studies on differentiated instruction within the Merdeka Curriculum collectively highlight the growing interest and effort to tailor learning to students' diverse needs. These studies employ various research methods, including qualitative, quasi-experimental, developmental, and survey approaches, reflecting a comprehensive exploration of the topic (Fauzia & Ramadan, 2023). Most researchers focus on elementary education, aiming to improve mathematics learning outcomes and critical thinking skills. A key finding is that differentiated instruction enhances student engagement and motivation by accommodating different learning styles and paces (Kriswanto & Fauzi, 2023). Furthermore, the integration of technology, such as e-modules, supports the differentiated approach by offering flexible and interactive learning experiences (Fahma & Bintoro, 2024). Teacher readiness and competence emerge as crucial factors influencing successful implementation, with many educators requiring additional training (Rofi'ah et al., 2024). Challenges such as time constraints and large class sizes persist, yet studies suggest policy support and professional development as viable solutions (Muthaharoh et al., 2024). The research also underscores the alignment of differentiated instruction with the Merdeka Curriculum's emphasis on student autonomy and holistic development. Collectively, these studies provide a solid foundation for advancing differentiated learning in Indonesia's evolving educational landscape. They further highlight the need for sustained institutional support to ensure equity and quality in learning (Hardianti et al., 2025).

Differentiated Instruction Strategies in the Context of the Merdeka Curriculum

Differentiated instruction strategies in the Merdeka Curriculum focus on adjusting content, process, product, and learning environment to meet students' individual needs (Fauzia & Ramadan, 2023). This approach encourages teachers to design flexible lessons that recognize diverse learning preferences, readiness levels, and interests. Research indicates that differentiation not only improves academic achievement but also enhances student motivation and engagement (Wahyuni, 2023). The use of differentiated student worksheets (LKPD) allows learners to explore mathematical concepts at varying levels of complexity, promoting deeper understanding (Mufliva et al., 2023). Additionally, technology-based tools like constructivist e-modules provide interactive and personalized learning experiences that support differentiated teaching (Fahma & Bintoro, 2024). Teachers' ability to effectively implement these strategies is essential, yet many require further training and ongoing support to develop the necessary skills. Studies also highlight the importance of adapting instructional design to overcome challenges such as limited class time and large student numbers. Differentiated strategies align well with the curriculum's emphasis on fostering critical thinking and character development (Hardianti et al., 2025). Thus, the Merdeka Curriculum encourages a student-centered learning environment that values diversity and encourages autonomy. These strategies represent a shift from traditional, one-size-fits-all teaching to a more inclusive and effective pedagogical practice.

Impact of Differentiated Instruction on Critical Thinking Skills

The impact of differentiated instruction on students' critical thinking skills has been extensively documented in recent research. Wahyuni (2023) found that students exposed to differentiated teaching showed significant improvement in their ability to analyze, evaluate, and synthesize information. Differentiated learning tasks encourage students to engage in problem-solving and higher-order thinking by offering challenges that match their readiness and interests. The integration of technology, such as differentiated e-modules, further enhances critical thinking by providing interactive scenarios that require active learner participation (Fahma & Bintoro, 2024). Differentiated worksheets also allow students to work at varying cognitive levels, which fosters deeper conceptual understanding and critical reflection. However, successful development of critical thinking through differentiation depends heavily on teachers' preparedness and their ability to scaffold learning appropriately. Challenges like time limitations and large classrooms can hinder individualized attention but can be mitigated by effective instructional design and policy support. Furthermore, differentiated

instruction supports the cultivation of critical thinking as part of broader student competencies, including collaboration and ethical reasoning. Overall, differentiated instruction represents a promising pedagogical approach to nurture critical thinking in line with the goals of the Merdeka Curriculum. Continued research and practice refinement are necessary to optimize its impact across diverse classroom contexts.

Discussion

The Merdeka Curriculum is here as a response to the dynamics of the learning needs of 21st century students. In this curriculum, differentiated learning is the main approach to meet the diversity of student characteristics. Teachers are required to understand students' readiness, interests, and learning profiles to design more personalized learning. This is in line with the principles of student-centered learning. In the context of learning mathematics, this approach is important to bridge the gap in conceptual understanding between individuals. Differentiated learning allows students with different levels of ability to develop optimally. According to Evendi et al. (2023), differentiation is not just a teaching method, but a philosophy about respecting diversity. Therefore, the integration of differentiated learning in the Independent Curriculum is a strategic step to strengthen the quality of learning in Indonesia.

The implementation of differentiated learning in mathematics is carried out by adjusting the content, processes, and learning products. Content differentiation refers to adjusting teaching materials according to the level of readiness of students. While process differentiation includes variations in the way students access and process information, such as through group discussions, experiments, or simulations. Product differentiation allows students to demonstrate their understanding in different ways, such as presentations, papers, or projects. Lema (2023) found that differentiated learning increases student engagement and motivation in mathematics learning. Students feel more confident because learning suits their needs. This also has a positive impact on the achievement of learning outcomes. In other words, differentiated learning opens up space for the creation of equitable and inclusive learning.

Critical thinking skills are one of the main competencies targeted in the Independent Curriculum. In mathematics learning, this skill is realized through students' ability to analyze problems, evaluate solutions, and make rational decisions. Differentiated learning supports the development of critical thinking skills because it provides a wide space for exploration. Students are not only asked to memorize formulas, but also invited to understand concepts and apply them in various contexts. According to Azis et al. (2024), critical thinking includes interpretation, analysis, inferences, explanations, and self-regulation. With the application of open-ended assignments, reflective discussions, and contextual problem-solving, students are trained to use all of these dimensions of critical thinking. Wahyuni (2022) showed that classes with differentiated approaches experienced a significant increase in critical thinking indicators compared to control classes. Thus, critical thinking skills can be built effectively through adaptive learning strategies.

The implementation of differentiated learning requires a deep understanding from teachers of the student's condition. Teachers must be able to conduct diagnostic assessments to identify individual students' learning readiness and needs. This process can be done through observation, interviews, or customized formative tests. The results of this assessment are the basis for developing relevant learning plans. Solihin et al. (2024) suggest that the use of differentially designed Learner Worksheets (LKPD) can increase learning effectiveness. Teachers also need to provide a variety of learning resources and flexible strategies so that students can learn according to their respective learning styles. Thus, differentiated learning not only adjusts the material, but also facilitates a meaningful learning process. This is a real implementation of the *student-centered learning principle* in the Independent Curriculum.

In mathematics learning, the development of critical thinking skills is essential to overcome difficulties in understanding abstract concepts. Differentiated strategies allow students to explore

concepts through approaches that fit their way of thinking. For example, students who are visual can make use of graphic or manipulative representations, while verbal students can learn through oral discussions or explanations. Khairunnisa et al. (2022) noted that this strategy is able to accommodate diverse learning styles and improve understanding of concepts. In addition, product differentiation provides students with the opportunity to express learning outcomes in a form that suits their strengths. It also trains critical thinking skills as students must determine the best way to convey solutions. Through this process, they learn to evaluate ideas and formulate logical arguments. In other words, differentiated strategies not only increase understanding, but also encourage reflection and self-evaluation.

Teachers have a central role in implementing differentiated learning effectively. Teacher readiness and competence are the determining factors in designing learning activities that are responsive to student needs. Rambung et al. (2023) underline that teacher training is needed so that they are able to develop adaptive teaching tools. One of the approaches used is *the Teacher Teaching Module* (TTM), which serves as a systematic guide for teachers in developing differentiated learning. This module includes student needs analysis, strategic planning, and evaluation of learning outcomes. Andriyanto et al. (2023) mentioned that teachers who have participated in TTM training have shown an improvement in designing varied and contextual learning. This shows the importance of institutional support in strengthening teacher capacity. Without this support, differentiated strategies will be difficult to implement sustainably.

The integration of technology in differentiated learning is also a concern in the Independent Curriculum. Technology enables the personalization of learning through digital platforms, such as interactive modules or adaptive math applications. The use of this technology supports teachers in providing materials that are appropriate to the student's level automatically. Solihin et al. (2024) show that constructivism-based e-modules developed differentially are able to improve students' learning outcomes and critical thinking skills. In addition, technology can facilitate formative assessments in real-time, so teachers can adjust learning quickly. This strengthens the reflective function in the student learning process. With the support of technology, differentiated learning can be done more efficiently and effectively. Therefore, the use of technology is an integral part of the differentiation strategy in 21st century mathematics education.

The challenges in the implementation of differentiated learning cannot be ignored. One of them is the time constraint in designing complex and individualized learning. In addition, the large number of students in a class can make it difficult for teachers to give enough attention to each individual. Wiryanto & Veronica (2024) emphasized that differentiated learning requires good classroom management so that the learning process remains conducive. Another challenge is limited resources, such as varied teaching materials and supporting facilities. Lack of training is also an obstacle in improving teachers' competence in differentiation. Therefore, synergy between teachers, schools, and the government is needed in creating a supportive learning ecosystem. Periodic evaluation and the provision of alternative learning resources can be a solution to overcome these barriers.

Although challenges remain, the results of the study show that differentiated learning has a significant positive impact. This learning not only improves academic achievement, but also builds students' character such as independence, responsibility, and tolerance. This is in accordance with the objectives of the Independent Curriculum which emphasizes the profile of Pancasila Students. Naibaho (2023) stated that the differentiation strategy strengthens the value of mutual cooperation and critical reasoning in mathematics learning. When students are given space to learn according to their uniqueness, they become more motivated and active. This creates a positive and inclusive learning environment. The long-term impact is an overall improvement in the quality of education. Thus, differentiated learning is an approach that is not only relevant, but also transformative.

Overall, differentiated learning is a relevant and effective pedagogical strategy in improving students' critical thinking skills in mathematics learning in the Independent Curriculum. This approach provides space for students to develop individually and meaningfully. Through proper assessment,

flexible strategies, and the support of technology and teacher training, learning can be tailored to the diversity of learners. The results of the study showed a significant increase in the indicators of critical thinking and student learning outcomes. Additionally, differentiated learning helps shape the character of students who are reflective, collaborative, and creative. The role of teachers as facilitators is the key to success in the implementation of this strategy. In the future, there needs to be policy strengthening and institutional support so that this strategy can be implemented consistently. Thus, the Independent Curriculum can be a driving force for educational transformation that is in favor of the potential and needs of students.

CONCLUSION

Based on the findings of the systematic literature review, it can be concluded that the implementation of differentiated instruction within the Merdeka Curriculum has a significant positive impact on students' critical thinking skills in mathematics learning. Differentiated strategies—whether in content, process, or product—enable students to learn according to their needs, readiness levels, and learning styles, which ultimately promotes meaningful and equitable learning experiences. Several studies showed that the integration of differentiated instructional models supports students' cognitive development, especially in enhancing their ability to analyze, evaluate, and solve mathematical problems critically. Moreover, the adoption of digital-based differentiated learning media, such as e-modules and LKPD, has also proven effective in encouraging student engagement and independence. However, challenges such as lack of teacher preparedness, time constraints, and large class sizes are frequently mentioned as barriers to optimal implementation. Despite these challenges, the overall body of evidence affirms that differentiated instruction is aligned with the goals of the Merdeka Curriculum, particularly in promoting student-centered and inclusive learning. Critical thinking as a core competency of the 21st century can be developed more systematically through structured differentiation. Therefore, schools and educators are encouraged to apply differentiation more broadly and sustainably within classroom practices.

REFERENCES

Andriyanto, Utaminingsih, R., & Nisa, A. F. (2023). Pengembangan Modul Ajar Berbasis Model Pembelajaran Discovery Learning dalam Mengembangkan Profil Pelajar Pancasila Kelas IV SD. *Wacana Akademika: Majalah Ilmiah Kependidikan*, *7*(1), 115–128.

Azis, H. S., Ganesha, U. P., & Tegal, B. (2024). Development of an Environmentally-Based Project-Based Learning (PjBL) Model as an Effort to Enhance Critical Thinking Skills in Elementary School Students. *Adi Widya: Jurnal Pendidikan Dasar*, *9*(2), 86–93.

Fahma, A. A., & Bintoro, H. S. (2024). Penerapan Modul Matematika Berbasis Pembelajaran Diferensiasi Untuk Meningkatkan Numerasi Siswa. *Kognitif: Jurnal Riset HOTS Pendidikan Matematika*, *4*(3), 1322–1331.

Fauzia, R., & Ramadan, Z. H. (2023). Implementasi pembelajaran berdiferensiasi dalam Kurikulum Merdeka. *Jurnal Educatio FKIP UNMA*, *9*(3), 1608–1617.

Furner, J. M., & Duffy, M. Lou. (2022). Addressing Math Anxiety in a STEM World: Preventative, Supportive, and Corrective Strategies for the Inclusive Classroom. *European Journal of STEM Education*, *7*(1), 11. https://doi.org/10.20897/ejsteme/12645

Hafana, B. R., Fadiyah, N., Aqila, Q. S., & Qomariyah, Y. (2024). Menggunakan Model Pembelajaran Berbasis Masalah dalam Pembelajaran Matematika dengan Pendekatan Diferensiasi. *Prosiding SEMINAR NASIONAL PENDIDIKAN MATEMATIKA (SNPM)*, *1*(1), 100–112.

Hanif Evendi, Yossie Rosida, & Dani Zularfan. (2023). Pembelajaran Berdiferensiasi dalam Pembelajaran Matematika di Kurikulum Merdeka SMPN 4 Kragilan. *Joong-Ki : Jurnal Pengabdian Masyarakat*, *2*(2), 181–186. https://doi.org/10.56799/joongki.v2i2.1454

Hanipah, S. (2023). Analisis kurikulum merdeka belajar dalam memfasilitasi pembelajaran abad ke-21 pada siswa menengah atas. *Jurnal Bintang Pendidikan Indonesia*, *1*(2), 264–275.

https://ejurnal.stie-trianandra.ac.id/index.php/JUBPI/article/view/1860

Hardianti, D., Asnawati, R., Utami, L. F., Asyhara, S. A., & Lestari, F. (2025). Hubungan Profil Pelajar Pancasila dalam Kerangka Merdeka Belajar terhadap Kemampuan Literasi Matematis Peserta Didik. *Jurnal Pendidikan Matematika Universitas Lampung*, *13*(1), 54–65.

Höfrová, A., Balidemaj, V., & Small, M. A. (2024). A systematic literature review of education for Generation Alpha. *Discover Education*, *3*(1), 125. https://doi.org/10.1007/s44217-024-00218-3

Kemendikbudristek. (2022). Buku Saku: Tanya Jawab Kurikulum Merdeka. *Kementerian Pendidikan, Kebudayaan, Riset dan Teknologi, Kementerian Pendidikan, Kebudayaan, Riset dan Teknologi*, 9–46.

Khairunnisa, A., Juandi, D., & Gozali, S. M. (2022). Systematic Literature Review: Kemampuan Pemahaman Matematis Siswa dalam Menyelesaikan Masalah Matematika. *Jurnal Cendekia : Jurnal Pendidikan Matematika*, *6*(2), 1846–1856. https://doi.org/10.31004/cendekia.v6i2.1405

Kriswanto, M., & Fauzi, N. B. (2023). Inovasi diferensiasi produk dengan metode alih wahana pada materi teks laporan hasil observasi. *Diglosia: Jurnal Kajian Bahasa, Sastra, dan Pengajarannya*, *6*(1), 43–52.

Lema, Y. (2023). Pendekatan Pembelajaran Berdiferensiasi untuk Meningkatkan Keaktifan dan Hasil Belajar Biologi Siswa Kelas XI SMA. *Prosiding Seminar Nasional Pendidikan Profesi Guru*, *1*(2), 3977–3990.

Mariana, N. (2025). Pengaruh Model Pembelajaran Problem Based Learning (PBL) Terhadap Kemampuan Berpikir Kritis Matematika Kelas V Sekolah Dasar. *Elementary School: Jurnal Pendidikan dan Pembelajaran ke-SD-an*, *12*(1), 233–239. https://doi.org/10.31316/esjurnal.v12i1.4388

Mufliva, R., Fitriani, A. D., & Iriawan, S. B. (2023). Pengembangan LKPD berbasis Alur "MERDEKA" sebagai penguatan Literasi Numerasi dalam Implementasi Pembelajaran Berdiferensiasi di Sekolah Dasar. *DWIJA CENDEKIA: Jurnal Riset Pedagogik*, *7*(3).

Muthaharoh, N. R., Kusmita, R., Kurniawan, M., & Afitri, S. (2024). Eksplorasi Tantangan dan Solusi Dalam Pembelajaran Berdiferensiasi Pada Kurikulum Merdeka. *Al Qodiri: Jurnal Pendidikan, Sosial dan Keagamaan*, *22*(1), 46–53.

Naibaho, D. P. (2023). Strategi pembelajaran berdiferensiasi mampu meningkatkan pemahaman belajar peserta didik. *Journal of Creative Student Research*, *1*(2), 81–91.

O.E.C.D. (2019). *PISA 2018 Results: What Students Know and Can Do*. OECD Publishing Frontiers. https://doi.org/10.3389/feduc.2022.910039

Rambung, O. S., Sion, Bungamawelona, Puang, Y. B., & Salenda, S. (2023). Transformasi Kebijakan Pendidikan Melalui Implementasi Kurikulum Merdeka Belajar. *Jurnal Ilmu Pendidikan*, *1*(3), 598–612. https://jip.joln.org/index.php/pendidikan/article/view/63

Rofi'ah, A. M., Shobirin, M., Fadllillah, M., Farah, N., & Wahyudi, M. F. (2024). Analisis Kesiapan Guru Dalam Penerapan Kurikulum Merdeka Di Sekolah Menengah Pertama. *Journal Educatione*, *1*(2).

Shihab, F., Fauzi, A., & Qurtubi, A. (2023). Adaptasi kebijakan kurikulum merdeka di sekolah dasar. *Jurnal Pendidikan dan Konseling (JPDK)*, *5*(2), 4600–4605.

Solihin, A., Habibie, R. K., & Rahmawati, I. (2024). Computational Thinking with the Guided-Discovery-Learning Model Using Ethnomathematics-Based LKPD. EDM in Elementary School. *DIDAKTIKA: Jurnal Pendidikan Sekolah Dasar*, *7*(1), 80–93. https://doi.org/10.21831/didaktika.v7i1.75845

Solihin, A., Kristanto, A., Gunansyah, G., Daoyi, Z., & Sijia, S. (2024). e-ScoutHix: Transforming Scouting Education in Junior High School through AI and Cultural Integration for Sustainable Character Development. *Educative: Jurnal Ilmiah Pendidikan*, *2*(3), 148–159. https://doi.org/10.70437/educative.v2i3.812

Wahyuni, A. S. (2022). Literature review: pendekatan berdiferensiasi dalam pembelajaran ipa. *Jurnal Pendidikan Mipa*, *12*(2), 118–126. https://doi.org/10.37630/jpm.v12i2.562

Wahyuni, A. S. (2023). *Pengaruh Model Pembelajaran Berbasis Proyek Dengan Strategi Berdiferensiasi Terhadap Keterampilan Berpikir Kritis Dan Berpikir Kreatif Siswa Pada Mata Pelajaran IPA*. Universitas Pendidikan Ganesha.

Wiryanto, W., & Veronica, A. R. (2024). Pelatihan Penerapan Pembelajaran Berdiferensiasi Berbantuan Media Online Virtual Manipulative│ Mathematical Modelling bagi Guru Sekolah Dasar Kecamatan Tegaldlimo-Banyuwangi. *Jurnal Pengabdian Pada Masyarakat*, *9*(2), 527–533.