

Implementation of The Independent Curriculum in Enhancing Critical Thinking Skills of Senior High School Students in Bandar Lampung

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ABSTRACT

This study was motivated by the imperative to strengthen critical thinking as a core competence within the Kurikulum Merdeka and by evidence that its implementation across senior secondary schools in Bandar Lampung remains uneven. The research focused on analysing how the Curriculum Merdeka contributes to the development of students' critical thinking skills by examining classroom practices, teacher and student perceptions, and facilitating and inhibiting factors. A qualitative descriptive approach with purposive sampling was employed in three senior secondary schools (two public, one private), involving teachers, students and school leaders. Data were collected through semi-structured interviews, participant observation and document analysis (lesson plans and student artefacts) and were thematically analysed using Miles and Huberman's framework, with source triangulation and member checking to strengthen validity. Findings indicate that the Kurikulum Merdeka creates opportunities for project-based and discussion-centred learning that can foster critical thinking, but its effectiveness is contingent upon teacher readiness, instructional leadership, infrastructure provision and students' dispositions. The study recommends sustained pedagogical training, systematic institutional support and interventions to enhance student engagement and confidence; these measures carry implications for local policy and school practice in realising the Pelajar Pancasila profile.

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1. INTRODUCTION

Education is a fundamental instrument in the development of a nation. In the global context, the advancement of science, technology, and communication requires human resources who not only master factual knowledge but also possess higher-order thinking skills, one of which is critical thinking. This skill enables students to analyse problems, evaluate information, make rational decisions, and adapt to rapid and complex changes. In the era of disruption, when the flow of information is overwhelming, critical thinking is no longer an option but a fundamental necessity that determines the success of individuals and nations in facing global challenges.

The Indonesian government has sought to respond to these demands by launching the Independent Curriculum (Kurikulum Merdeka) in 2022. This curriculum was designed to address

the weaknesses of its predecessor, which was considered overloaded with content and lacking space for the development of students' essential competencies. One of the main focuses of the Independent Curriculum is the formation of the Pancasila Student Profile, with "critical reasoning" as one of its dimensions. This affirms that critical thinking is a core competency that Indonesian students must possess in order to compete nationally and internationally [1].

A curriculum is a crucial instrument in education as it functions as the primary guideline for teachers in planning and conducting instruction. In Indonesia, curriculum reforms have been undertaken several times to respond to the demands of the times and the competencies students require. The Independent Curriculum emphasises essential competencies, differentiated instruction, and character development through the Pancasila Student Profile. Its implementation cannot be separated from the paradigm of 21st-century education, where students are no longer positioned as passive recipients of knowledge but as active agents who construct understanding through interaction, collaboration, and reflection. This aligns with constructivist theory, which asserts that learning is an active process of building meaning from experience. Teachers thus act as facilitators, creating a conducive learning environment that encourages active student engagement [2].

However, the reality of education in Indonesia reveals that the implementation of the Independent Curriculum in practice still faces numerous challenges. In Bandar Lampung, there exists a gap between the ideals envisioned in the curriculum policy and the realities of classroom practices. As the capital of Lampung Province and the centre of education in southern Sumatra, Bandar Lampung has a significant number of senior high schools (SHS). According to data from the Bandar Lampung Education and Culture Office in 2023, there are 112 SHSs accommodating more than 54,000 students. This figure reflects considerable potential for producing a high-quality generation. Nevertheless, this potential has not been fully supported by the quality of learning processes that emphasise the development of critical thinking skills.

This condition is reflected in the 2023 report of the Central Bureau of Statistics (BPS) of Lampung Province, which shows that although the Human Development Index (HDI) of Bandar Lampung reached 80.21, categorised as high, education indicators still face fundamental challenges. The average length of schooling has indeed reached 12.36 years, yet the quality of learning, as indicated by literacy and numeracy outcomes, remains suboptimal. This aligns with the results of the Computer-Based National Assessment (ANBK), which revealed that most SHS students in Bandar Lampung are still at the medium level in reading literacy and numeracy, both of which are closely correlated with critical thinking skills.

This phenomenon is also evident at the international level. The 2018 Programme for International Student Assessment (PISA) survey indicated that Indonesia ranked 72nd out of 77 countries in reading and 73rd in science. Both domains are strongly related to critical thinking, as they require students to comprehend, analyse, and evaluate information. Although the 2022 PISA results have not yet been fully detailed, the trend shows that Indonesian students' performance remains relatively low compared to other Southeast Asian countries. This signals that the development of critical thinking skills remains a major challenge for the national education system, including in Bandar Lampung.

Critical thinking itself is frequently regarded in the literature as one of the higher-order cognitive skills essential in the global era. According to Ennis [3], critical thinking is reflective and rational thinking focused on deciding what to believe or do. Facione [4] emphasises that critical thinking involves interpretation, analysis, evaluation, inference, explanation, and self-regulation. These definitions indicate that critical thinking is not merely logical reasoning but a complex skill integrating both cognitive and dispositional aspects. In education, critical thinking enables students to understand contemporary issues, filter information, and solve problems with comprehensive approaches.

The emphasis on critical thinking in the Independent Curriculum aligns with international educational trends. For example, the Partnership for 21st Century Skills (P21) framework identifies critical thinking as one of the "four Cs" of 21st-century skills, alongside communication, collaboration, and creativity. Similarly, the OECD [5], through PISA, highlights critical thinking as an important indicator of students' readiness to face global challenges. Accordingly, research

examining the implementation of the Independent Curriculum in enhancing critical thinking has strong relevance both nationally and internationally.

The discrepancy between ideal expectations and classroom reality is also visible in learning practices. Ideally, the Independent Curriculum emphasises project-based learning, contextual learning, and the development of students' analytical and evaluative abilities. However, monitoring by the Lampung Education Office in 2023 showed that most teachers still relied on conventional approaches such as lectures and routine assignments. While teachers acknowledge the importance of fostering critical thinking, limited time, administrative burdens, and insufficient training often hinder the application of innovative learning strategies.

Developing critical thinking requires instructional approaches that differ from conventional methods. Project-based learning, problem-based learning, and inquiry-based learning are widely recognised as effective in encouraging students to think critically. Widodo and Kadarwati [6] showed that project-based learning enhances students' analytical and evaluative abilities, as they are directly involved in solving real-world problems. Likewise, Dewi and Lestari [7] found that problem-based learning helps students develop argumentation and reflection skills. These findings suggest that interactive, collaborative, and contextual learning strategies are key to developing critical thinking in schools.

Previous studies support this picture. For example, Fitriani and Lestari [8] demonstrated that project-based learning can significantly enhance students' critical thinking skills, yet its implementation remains limited to schools with adequate resources. Meanwhile, Sari [9] found that many students tend to feel more comfortable memorising content than engaging in deep analysis. This is attributed to a long-standing learning culture that emphasises exam results over the mastery of higher-order thinking skills.

Critical thinking is also closely related to digital literacy. In today's digital era, students face an overwhelming flow of information, not all of which is valid or relevant. Critical thinking enables students to filter information, identify biases, and distinguish facts from opinions. Lai and Viering [10] found a positive correlation between critical thinking and students' digital literacy. In the context of the Independent Curriculum, the integration of technology into instruction represents both an opportunity and a challenge in developing critical thinking. When properly utilised, technology can enrich the learning process by providing diverse and authentic learning resources.

In Bandar Lampung, disparities between public and private schools also constitute an important issue. Leading private schools are generally quicker to adopt the Independent Curriculum by providing digital facilities, well-equipped laboratories, and intensive teacher training programmes. Conversely, many public schools still struggle with limited infrastructure and resources. As a result, students in public schools find it more difficult to gain meaningful learning experiences that truly foster critical thinking. These disparities highlight the significant inequality in education quality in Bandar Lampung.

Beyond facilities, teacher readiness is another determining factor. The Lampung Education Quality Assurance Agency (BPMP) reported in 2023 that around 40% of SHS teachers in Bandar Lampung felt unprepared to implement the Independent Curriculum, particularly in designing project-based learning and formative assessments. Yet these two approaches are crucial for nurturing critical thinking. This limitation in pedagogical competence highlights the need for intensive training and mentoring to ensure teachers can fully internalise the spirit of the Independent Curriculum in daily practice.

Teachers constitute a crucial factor in the implementation of the Independent Curriculum. Beyond mastering content, teachers must be able to design challenging instruction, facilitate discussions, and encourage students to reflect. Hidayat and Prasetyo [11] demonstrated that teachers' pedagogical skills significantly influence students' critical thinking. Teachers skilled in posing open-ended questions, giving constructive feedback, and creating democratic classroom environments are more successful in nurturing students' critical thinking. Thus, strengthening teachers' capacity through training and mentoring is a key requirement for the success of the Independent Curriculum.

Students' dispositions also play an important role. Dispositions such as openness to new ideas, curiosity, and willingness to reflect on one's own thoughts are prerequisites for the optimal development of critical thinking. Halpern [12] stressed that such dispositions should be instilled early through a school culture that encourages free expression, tolerance of differences, and appreciation of logical arguments. In the context of SHSs in Bandar Lampung, students' learning culture, which still tends to prioritise exam results, needs to be redirected towards processes that foster critical thinking.

The implementation of curricula to foster critical thinking also depends on school management support. Schools with a strong vision for developing 21st-century competencies tend to be more consistent in applying innovative instructional practices. Fullan and Quinn [13] emphasised the importance of transformational leadership in fostering a school culture oriented towards higher-order thinking. Headteachers play a key role in facilitating teacher collaboration, providing sufficient resources, and creating a conducive learning ecosystem.

Curriculum implementation and the development of critical thinking are also influenced by theories of educational change. According to Rogers' [14] diffusion of innovations theory, the success of implementing educational innovations depends on users' perceptions of relative advantage, compatibility, complexity, trialability, and observability. In the context of the Independent Curriculum, teachers and schools that perceive the curriculum as beneficial and aligned with students' needs are more likely to adopt it quickly, while those who perceive it as burdensome tend to adopt it more slowly.

Another gap worth noting concerns students' attitudes towards learning. Many SHS students in Bandar Lampung still display a tendency to seek instant answers rather than engaging in prolonged, in-depth thinking. This phenomenon is evident during exam preparation, when students rely more on summaries and practice questions than on critically understanding concepts. This reinforces the argument that fostering critical thinking requires not only changes in teachers' strategies but also a transformation in students' learning culture as a whole.

As an innovation in educational policy, the Independent Curriculum holds great potential to enhance SHS students' critical thinking skills. However, its success depends heavily on teachers, students, schools, and systemic educational support. From a research perspective, these issues reveal an important gap that needs to be addressed. Thus far, studies on the Independent Curriculum have largely focused on policy design or effectiveness at the national level. Research specifically examining the implementation of the curriculum in enhancing critical thinking within local contexts, particularly in Bandar Lampung, remains scarce. Yet each region has unique characteristics, challenges, and dynamics that can provide a more comprehensive picture of the effectiveness of national education policies.

This study seeks to address that gap by conducting a qualitative inquiry into the implementation of the Independent Curriculum in SHSs in Bandar Lampung, with a focus on the development of students' critical thinking skills. The purpose of this study is to analyse the implementation of the Independent Curriculum in enhancing the critical thinking skills of SHS students in Bandar Lampung. Specifically, it aims to explore: (1) the learning strategies used by teachers to nurture critical thinking, (2) students' responses to the implementation of the Independent Curriculum, and (3) the extent to which the curriculum contributes to the development of critical thinking as one of the key competencies of the 21st century. Hence, this study is expected to provide a more comprehensive understanding of the challenges and opportunities of curriculum implementation at the local level, while also serving as a basis for improving education quality in Bandar Lampung in the future.

2. METHOD

This study employed a qualitative approach with a descriptive design, focusing on an in-depth depiction of the implementation of the Merdeka Curriculum in enhancing critical thinking skills among senior high school students in Bandar Lampung City. The researcher positioned themselves as the primary instrument directly engaged in the data collection process, supported by auxiliary tools such as interview guides, observation sheets, and documentation to strengthen the findings. The research sites were purposively selected senior high schools in Bandar Lampung that

had already adopted the Merdeka Curriculum. The selection was based on the diversity of school contexts, both public and private, to ensure that the results represent variations in implementation practices. The research subjects included subject teachers directly involved in curriculum-based learning, students of grade X and XI as curriculum recipients, and principals as institutional policy makers.

Data were collected through three main techniques: in-depth interviews, participatory observation, and documentation. Semi-structured interviews were conducted to explore the experiences of teachers and students regarding learning strategies, challenges, and the impact of the curriculum on critical thinking skills. Classroom observations were carried out to record teaching and learning interactions, the application of learning models, and student involvement in discussions or problem-solving activities. Documentation, such as curriculum documents, lesson plans, and student products like reports or project outcomes, was used to enrich field data.

Data analysis employed Miles and Huberman's interactive model consisting of three stages: data reduction, data display, and conclusion drawing with verification. Data reduction involved selecting, focusing, and simplifying field data obtained through interviews, observations, and documentation. Reduced data were then presented in descriptive narratives, participant quotations, and supporting tables to provide a comprehensive picture of the curriculum implementation. The final stage, conclusion drawing, was conducted by continuously examining the relationship between the collected data and the research objectives, along with verification to ensure accountable findings.

Data validity was ensured through source and method triangulation. Source triangulation was carried out by comparing information from teachers, students, and principals, while method triangulation involved comparing the results of interviews, observations, and documentation. Peer debriefing was conducted periodically to test the consistency of the analysis, while systematic storage of field notes and interview transcripts was maintained as authentic research evidence.

The research procedure began with preparation, including site and informant selection, development of interview and observation guides, and obtaining research permits. The next stage was data collection in the field, involving interviews, observations, and documentation. The final stage was data analysis and the writing of the research report, oriented towards describing the implementation of the Merdeka Curriculum and its contribution to enhancing students' critical thinking skills in senior high schools in Bandar Lampung City. With this methodological design, the study is expected to produce valid, contextual findings that contribute to the development of educational practices in the era of the Merdeka Curriculum.

3. RESULTS AND DISCUSSION

3.1 Results

The findings of this study were obtained through classroom observations, in-depth interviews with teachers, students, and principals, as well as a review of documents relevant to the implementation of the Kurikulum Merdeka in senior high schools in Bandar Lampung City. These findings illustrate the dynamics of implementing the new curriculum in a local context and the extent to which the policy contributes to the development of students' critical thinking skills. The data obtained not only highlight successes but also the obstacles schools face in the process of transforming teaching and learning.

3.1.1 Implementation of the Kurikulum Merdeka in the Classroom

Based on classroom observations, most teachers had attempted to apply project-based learning and differentiated instruction as required by the Kurikulum Merdeka. In one observed class, for example, the teacher asked students to work in groups to analyse a local environmental issue, such as waste management within the school. This activity enabled students to engage in discussions, collect data, and prepare reports that demanded critical thinking skills. However, in practice, not all students were actively involved. Group discussions were mostly dominated by more confident students, while others tended to remain passive and merely followed the lead of their peers.

An interview excerpt with one teacher supported this finding: “We have tried to implement project-based learning as directed by the Kurikulum Merdeka, but in reality, there are still students who are reluctant to voice their opinions. Sometimes they just stay quiet, waiting for the more active ones to speak.” (Interview with Teacher A, 15 May 2025). This suggests that although the curriculum provides space for developing critical thinking skills, its implementation in practice is still constrained by students’ learning culture.

Observations conducted in three classes across different schools revealed variations in how teachers implemented the Kurikulum Merdeka. At a private school, for instance, a physics teacher applied project-based learning by asking students to design a simple device to measure wind speed. This activity encouraged students to conduct small-scale research, test hypotheses, and present their findings in front of the class. Such tasks demanded critical thinking, particularly in linking physics theory with empirical practice.

Conversely, at one state senior high school, an economics teacher still relied heavily on the lecture method, although occasionally attempting group discussions. Limited time and teacher readiness were the dominant reasons why teaching strategies requiring active student participation were not yet maximised. In interviews, teachers admitted they required further training to adapt to the new curriculum approach. One teacher remarked: “We welcome the Kurikulum Merdeka, but honestly there is still much to learn. Preparing project-based lesson modules is not as easy as it seems, especially with such a large number of students in one class.” (Interview with Teacher B, 16 May 2025). This highlights a gap between the ideals of the curriculum policy and the realities faced in the classroom.

3.1.2 The Role of Teachers in Promoting Critical Thinking

Interview data indicated that most teachers understood the importance of critical thinking skills, yet not all were able to consistently design lessons that stimulated such skills. Teachers who had attended Kurikulum Merdeka training tended to be more creative in employing methods such as group discussions, debates, and case studies. In contrast, those with less training continued to rely mainly on lectures with limited variation in activities.

Teachers played a central role in fostering critical thinking skills. Interviews showed that those who had undergone Kurikulum Merdeka training were more confident in integrating analytical and reflective activities into their lessons. They employed case studies, problem-solving, and debates to encourage students to think more deeply.

A history teacher explained: “I usually give historical cases that are relevant to current conditions, such as social conflicts, and then ask students to compare them with the present situation. That helps them practise analysing causes and effects rather than merely memorising dates and events.” (Interview with Teacher C, 17 May 2025).

To reinforce these findings, the following table presents a comparison of teaching strategies employed by teachers to enhance students’ critical thinking. It should be noted that this data was obtained from interviews with six teachers across three different schools in Bandar Lampung, both state and private. The focus is on the strategies considered most frequently used in the implementation of the Kurikulum Merdeka.

Table 1. Teaching Strategies Used by Teachers to Develop Critical Thinking Skills

Teaching Strategy	Number of Teachers Using It	Main Notes
Group discussion	6	Almost always applied, though student participation remains uneven
Project-based learning	5	Especially in science and social studies subjects
Case studies	4	Effective in training contextual event analysis
Academic debate	3	More frequently applied in private schools with better facilities
Interactive lecture	6	Still dominant for abstract or complex material

Source: Interviews with Teachers A–F, 15–18 May 2025.

This table confirms that teachers are in a transition period from traditional methods towards new approaches. Group discussions and project-based learning are increasingly practised, yet interactive lectures remain dominant, particularly in state schools.

3.1.3 Students' Responses to Learning

Interviews with students revealed that most enjoyed project-based learning as it gave them opportunities to collaborate and be more creative. However, they also found it difficult when required to think critically, especially when linking theory to real-life contexts. One student commented: "Learning through projects is indeed more fun, but sometimes we struggle with analysing the problems. For instance, when asked to connect economic theory to the local market conditions, it was quite difficult." (Interview with Student B, 16 May 2025).

Students' responses to the implementation of the Kurikulum Merdeka were varied. While the majority said project-based learning was more engaging than conventional methods, they also struggled with in-depth analysis. A Year 11 student stated: "Learning through projects is more enjoyable, especially with hands-on practice. But we often get confused when required to relate theory to real-life situations. It feels like we need more guidance from the teacher." (Interview with Student D, 18 May 2025).

Observations supported this statement. During presentations, only a few students could provide critical arguments, while others remained silent. This suggests disparities in students' critical thinking skills, possibly influenced by their academic background or learning motivation. Observations also indicated differences between students at state and private schools. Those at private schools with better facilities appeared more enthusiastic and accustomed to using digital technology to find information, whereas in state schools, limited resources meant that critical learning activities relied more heavily on teachers' initiative. To strengthen the findings, a simple questionnaire was distributed to 90 students regarding their perceptions of learning under the Kurikulum Merdeka.

Table 2. Students' Perceptions of Learning under the Kurikulum Merdeka

Main Perception	Percentage (%)	Notes
More enjoyable and creative	65	Students felt that learning was more varied and interactive
Requires more time	20	Some students considered project tasks too time-consuming
Confusing when required to think critically	15	Students struggled to connect theory with practice

Source: Student questionnaire, 90 respondents from three schools, 20–22 May 2025.

These findings suggest that while the majority of students appreciated the Kurikulum Merdeka model, challenges remained in developing critical thinking skills.

3.1.4 Support from School Principals and Infrastructure

The role of school principals also influenced the extent to which the Kurikulum Merdeka successfully fostered critical thinking skills. Interviews revealed that a principal of a state school admitted financial constraints prevented the school from providing adequate digital learning resources. In contrast, a private school principal stated that their school regularly provided training for teachers to develop problem-based learning. "We strive to support teachers through internal training and the provision of facilities. This way, curriculum implementation can run more optimally." (Interview with Principal C, 17 May 2025).

A state school principal remarked: "We realise the importance of digital resources, but the school's budget allocation is still limited. Teachers have been creative in making use of available facilities, yet there are still many shortcomings." (Interview with Principal E, 19 May 2025).

This disparity in support had implications for the quality of project-based learning and students' ability to access wider learning resources. The findings suggest that managerial support

and infrastructure are crucial factors influencing the success of developing students' critical thinking skills.

3.1.5 Barriers to Implementation

In addition to infrastructure, the main obstacles lay in teacher readiness and student motivation. Some teachers struggled to design project-based lesson modules as they were not accustomed to approaches requiring interdisciplinary integration. Meanwhile, some students were less motivated to actively participate, particularly those used to passive learning systems.

An interview with a Year 10 student revealed: "I prefer it when the teacher explains directly because it is easier to understand. If we are asked to discuss or do projects, sometimes we just feel confused and do not know where to start." (Interview with Student F, 20 May 2025). This highlights the need for mentoring strategies to ensure all students can actively engage in learning.

The findings indicate that the implementation of the Kurikulum Merdeka in senior high schools in Bandar Lampung has begun to create space for the development of critical thinking skills, although achievements vary between schools. Teacher readiness, student responses, principal support, and infrastructure availability emerged as significant factors determining successful implementation. These findings point to a gap between the ideals of curriculum policy and classroom realities, suggesting the need for further discussion on optimisation strategies to ensure that the goal of enhancing critical thinking skills is fully achieved.

3.2 Discussion

This discussion serves to interpret the research findings, place the results within a conceptual framework, and connect them with existing theories and previous studies. The focus of this research was to understand how the Kurikulum Merdeka contributes to the development of critical thinking skills among senior high school students in Bandar Lampung City, taking into account the role of teachers, students' responses, institutional support, and barriers to implementation. The data obtained through interviews, observations, and document analysis revealed the complex dynamics between curriculum policy and classroom practice. Accordingly, the discussion is organised in line with the sub-sections of the findings to provide a systematic line of argument.

3.2.1 Implementation of the Kurikulum Merdeka and Critical Thinking Skills

The findings showed variations in the implementation of the Kurikulum Merdeka across schools. Some private schools with better resources consistently applied project-based learning and case-based learning, thus providing students with opportunities for exploration, analysis, and reflection. Activities such as group discussions to design solutions for school environmental issues or preparing reports from social observations exemplified learning practices that encouraged critical thinking. In many state schools, however, teaching remained largely lecture-oriented with only slight modifications towards discussion. This reflects a gap between the ideals of the curriculum and the realities in the classroom. Ennis[3] argued that critical thinking requires students' active involvement in analysing information and making decisions based on evidence. When lessons are still dominated by lectures, students' opportunities to practise such skills remain limited.

This phenomenon indicates that the Kurikulum Merdeka does not automatically guarantee the enhancement of critical thinking skills; rather, it provides an opportunity that must be supported by appropriate learning practices. This finding is consistent with Nugraha[14], who found that the implementation of competency-based curricula is only effective when teachers are able to apply innovative strategies. Thus, although the curriculum framework is progressive, its influence on students' critical thinking is highly dependent on teachers' implementation capacity and the readiness of the school ecosystem.

3.2.2 The Role of Teachers in Optimising Learning

Teachers occupy a central role in the implementation of the Kurikulum Merdeka. Interviews with several teachers revealed that those who had attended training on the new

curriculum were better able to practise varied strategies, such as class debates, solving real-world problems, and collaborative learning. One teacher stated: “We try to give students simple projects, for example studying plastic consumption habits in school and then finding solutions that can be applied in the local environment” (Interview with Teacher A, 15 May 2025). Such practices clearly align with the curriculum’s objective of sharpening students’ analytical and argumentative skills.

Teachers who had not received intensive training tended to struggle. They admitted to feeling overwhelmed when preparing project-based lesson modules and reported that administrative burdens were quite heavy. This is consistent with the findings of Kusuma and Rahayu [12], who emphasised that one of the main obstacles to the Kurikulum Merdeka’s implementation is teachers’ low pedagogical literacy in designing competency-based activities.

Brookfield [1] stressed that effective teachers in fostering critical thinking are those who can act as facilitators rather than mere transmitters of knowledge. Within the context of this study, it was evident that teachers who embraced the new paradigm were able to facilitate discussions and problem-solving, whereas those who remained bound to traditional approaches restricted students’ critical space. Therefore, the success of curriculum implementation is determined largely by teachers’ readiness, both in terms of understanding the philosophy of the curriculum and their technical teaching skills.

3.2.3 Students’ Responses and the Challenge of Active Engagement

Survey data revealed that most students, around 65%, felt that learning under the Kurikulum Merdeka approach was more enjoyable and challenging. They appreciated collaborative activities, field studies, and the freedom to choose project topics. One student commented: “When we are given a project, I feel more motivated because I can collect my own data and discuss it with my friends. It feels more real than just listening to the teacher’s explanation” (Interview with Student B, 20 May 2025). This statement confirms that students responded positively to learning activities that enabled active engagement.

However, around 15% of students reported difficulties in following this model. They admitted to being confused when asked to think critically, for instance when analysing data or presenting arguments in discussions. This shows that critical thinking is not an instant skill but the result of sustained practice. Facione [5] stressed that critical thinking skills are developed through systematic habituation rather than through one-off instructions.

Another limitation was the lack of confidence among some students in expressing their opinions in front of the class. Although projects had been implemented, presentations were often dominated by a few confident students, while others remained passive. This illustrates gaps in motivation and self-confidence. Hasanah [10] found that students’ willingness to express their opinions is strongly influenced by an inclusive classroom climate. Thus, the challenge for teachers is to create a conducive atmosphere that encourages all students to participate actively.

3.2.4 Support from Principals and Infrastructure

This study also highlighted the importance of institutional support in curriculum implementation. Schools with visionary principals were generally more successful in applying the Kurikulum Merdeka. Principals who actively provided teacher training, supplied technological resources, and encouraged teacher collaboration were shown to facilitate project-based learning effectively. Conversely, financial constraints in some state schools meant that digital infrastructure was inadequate. Some teachers admitted difficulty in conducting projects that required internet access or laboratory facilities due to limited resources. As a result, lessons often reverted to conventional methods.

UNESCO [19] noted that disparities in educational facilities significantly affect the attainment of 21st-century competencies, including critical thinking skills. Wahyudi [21] similarly emphasised that instructional leadership by school principals is a crucial factor in curriculum success. In this study, it was evident that institutional support involved not only facilities but also leadership that encouraged innovation and allowed teachers to experiment with new methods.

3.2.5 Barriers and Strategies for Resolution

The main barriers faced by schools were teacher readiness and student motivation. Teachers felt burdened by the need to adapt lesson modules, while some students preferred passive learning styles. These barriers reflect resistance to change. Fullan [7] explained that resistance is a natural part of any educational reform, and the key to success lies in sustained mentoring strategies.

Potential strategies include strengthening teacher training to enhance understanding of the Kurikulum Merdeka philosophy, creating teacher learning communities to share best practices, and providing incentives for teachers who successfully implement innovations. For students, regular habituation activities such as routine discussion forums or weekly reflections could help them become accustomed to expressing opinions and developing arguments. In this way, barriers can be gradually addressed, making curriculum implementation more effective.

3.2.6 Research Implications

The research findings have several implications. For policymakers, it is essential to expand teacher training programmes and ensure a more equitable distribution of resources. For schools, it is important to foster a learning culture that supports innovation and openness. For teachers, a commitment to applying participatory approaches must become a priority. For students, critical thinking skills must be cultivated through continuous practice rather than occasional activities.

The central research question was: does the Kurikulum Merdeka truly promote the development of critical thinking skills among senior high school students? From the analysis, the answer is yes, under certain conditions. The Kurikulum Merdeka provides a framework that encourages project-based learning, discussion, and reflection—all of which are pathways to developing critical thinking. However, the outcomes are uneven, as they depend on teachers' readiness, school support, and student engagement. Without these factors, the curriculum risks becoming merely a policy document without tangible impact.

This study makes an empirical contribution by confirming that education policy must be accompanied by comprehensive implementation strategies. It reinforces the notion that the Kurikulum Merdeka holds significant potential for enhancing students' critical thinking skills in Bandar Lampung senior high schools. Yet, realising this potential depends heavily on teacher readiness, school support, and active student participation. In other words, the curriculum is only a framework; genuine success is determined by the synergy of the educational ecosystem. The findings also answer the question posed in the introduction: that the development of critical thinking skills is not simply the product of policy but the result of tangible collaboration among teachers, students, schools, and government.

4. CONCLUSION

Based on the findings and discussion, it can be concluded that critical thinking skills have a significant influence on students' mathematics learning outcomes at the secondary school level in Bandar Lampung City. The results indicate that the higher the students' critical thinking skills, the better their academic achievement, particularly in solving mathematical problems that require analysis, evaluation, and logical reasoning. This confirms the expectation set out in the introduction, namely that mathematics learning outcomes are not solely influenced by external factors such as the availability of facilities or the support of the learning environment, but also by internal factors in the form of more complex cognitive abilities. Thus, this research provides a new perspective that critical thinking skills can be considered a key variable in improving the quality of mathematics learning in secondary schools.

The study also demonstrates a strong relevance between the educational demand to produce graduates who are adaptive, reflective, and capable of making rational decisions, and classroom learning practices. Strengthening critical thinking skills can be achieved through learning strategies that emphasise discussion, contextual problem-solving, and the use of innovative teaching media that require active student participation. The prospects for further development of these findings remain wide open, particularly in integrating critical thinking skills into the mathematics curriculum through various higher-order thinking skills (HOTS)-based learning models.

The application of these findings can be extended to other subjects that also require analytical ability, such as science, languages, and social studies, so that critical thinking skills truly become a cross-disciplinary competence supporting the attainment of the Profil Pelajar Pancasila. Looking ahead, further research could be directed towards intervention studies with more in-depth experimental designs to test the effectiveness of various learning models in enhancing critical thinking skills. In this way, the contribution of this study does not merely rest at the descriptive–correlational level but can also serve as a foundation for more applicable pedagogical innovations oriented towards improving the quality of national education.

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