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Promoting Sustained Learning through Critical Thinking Pedagogies: A Comparative Study of Singapore and Indonesia

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Abstract

This study aims to comparatively analyze critical thinking pedagogies in Singapore and Indonesia by examining how primary school teachers within the frameworks of Teach Less, Learn More (TLLM) and the Kurikulum Merdeka design and implement instruction that deliberately directs students to think critically. The research employs a qualitative approach with a cross- national descriptive-comparative design, involving two teachers from Singapore and five teachers from Indonesia as participants. Data were collected through semi-structured interviews, classroom observations, and analysis of policy and curriculum documents, and were then analyzed using thematic analysis focusing on strategies of content reduction, the design of authentic tasks and projects, the use of higher-order questioning and argumentative discussion, as well as the facilitation of students' metacognitive reflection. The findings indicate that both TLLM and the Kurikulum Merdeka possess strong potential to foster critical thinking skills; however, teachers in Singapore are more consistent in operationalizing these principles in classroom practice through deep, dialogic, and reflective learning, whereas teachers in Indonesia are still in a transitional phase from traditional teaching patterns toward pedagogies that are genuinely oriented toward critical thinking.

[Penelitian ini bertujuan untuk menganalisis secara komparatif pendekatan pedagogi berpikir kritis di Singapura dan Indonesia dengan menelaah bagaimana guru sekolah dasar dalam kerangka kerja Teach Less, Learn More (TLLM) dan Kurikulum Merdeka merancang dan melaksanakan pembelajaran yang secara sengaja mengarahkan siswa untuk berpikir kritis. Penelitian ini menggunakan pendekatan kualitatif dengan desain deskriptif-komparatif lintas negara, yang melibatkan dua guru dari Singapura dan lima guru dari Indonesia sebagai peserta. Data dikumpulkan melalui wawancara semi-terstruktur, observasi kelas, dan analisis dokumen kebijakan serta kurikulum, kemudian dianalisis menggunakan analisis tematik yang berfokus pada strategi pengurangan materi, desain tugas dan proyek otentik, penggunaan pertanyaan tingkat tinggi dan diskusi argumentatif, serta fasilitasi refleksi metakognitif siswa. Temuan menunjukkan bahwa baik TLLM maupun Kurikulum Merdeka memiliki potensi yang kuat untuk menumbuhkan keterampilan berpikir kritis; namun, guru di Singapura lebih konsisten dalam mengimplementasikan prinsip-prinsip ini dalam praktik kelas melalui pembelajaran yang mendalam, dialogis, dan reflektif, sedangkan guru di Indonesia masih berada dalam fase transisi dari pola pengajaran tradisional menuju pedagogi yang benar-benar berorientasi pada berpikir kritis.] © The Authors.

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1. Introduction

21st-century education requires learner competencies beyond content memorization [1]. One essential competency is critical thinking, namely the ability to analyze, evaluate, synthesize information, and solve problems reflectively and creatively [2]. This ability reflects academic readiness and preparedness for the growing complexity of social, economic, and technological life [3]. Critical thinking is important because it enables individuals to make sound decisions, solve problems rationally, and adapt to the complex, information-rich, and uncertain 21st century [8]. It trains learners to assess source reliability, verify data, identify bias, and build evidence-based arguments, reducing vulnerability to misinformation and social pressure [9]. In schools, critical thinking strengthens learning autonomy, confidence in expressing opinions, reflective thinking, and readiness for higher education, work, and responsible citizenship [10].

Teach Less, Learn More (TLLM) in Singapore is an educational reform framework designed to reduce rote learning and give teachers more space to create meaningful, student-centered learning experiences [11]. The implementation of Teach Less, Learn More (TLLM) in Singapore is carried out through curriculum restructuring and the reduction of less essential content, giving teachers more time to deepen concepts, design meaningful tasks, and facilitate higher-order learning [18]. Schools are given flexibility to reduce routine exercises and replace them with projects, case studies, and inquiry-based activities that encourage analysis, evaluation, and connections to real-world contexts [13].

In Indonesia, the Kurikulum Merdeka positions critical reasoning as a core competency through the Profil Pelajar Pancasila and contextual project-based learning [27]. Students are encouraged to identify real problems, analyze data, consider alternative solutions, and present findings argumentatively, emphasizing thinking processes rather than final answers alone [28]. By promoting exploration, collaboration, and reflection, the Kurikulum Merdeka seeks to shift learning from content delivery toward systematic development of critical thinking skills [29].

At the practical level, teachers in Indonesia are expected to design learning experiences that encourage questioning, testing assumptions, and connecting knowledge with local socio-cultural contexts, although implementation still faces challenges related to pedagogical readiness and limited resources [30]. Through teacher learning communities, continuous training, and project-based teaching modules, the government supports the transformation of teachers from “information transmitters” into “facilitators of critical thinking” within the Kurikulum Merdeka framework [31]. Thus, both Singapore through TLLM and Indonesia through the Kurikulum Merdeka aim to strengthen critical thinking, despite differences in social, cultural, and educational contexts. Studies on critical thinking in education identify it as a key 21st-century competency that should be developed through dialogic, reflective, and problem-based learning rather than rote memorization or factual mastery [32].

However, most studies focus on policy, curriculum design, or general learning outcomes, while relatively few examine teachers’ roles as facilitators of critical thinking in classroom practice, particularly from a comparative perspective between Singapore and Indonesia. Existing research tends to discuss TLLM [15] and the Kurikulum Merdeka [28] separately, without exploring how teachers design authentic tasks, pose higher-order questions, manage discussions, and create classroom cultures that support critical thinking [33]. Consequently, there remains a research gap regarding teachers’ pedagogical strategies in these two educational contexts, despite teachers being key actors in translating critical thinking principles into classroom practice. Based on this gap, this study comparatively examines critical thinking pedagogies in Singapore and Indonesia by analyzing how primary school teachers within the frameworks of Teach Less, Learn More (TLLM) and the Kurikulum Merdeka design and implement learning experiences that foster students’ critical thinking.

2. Method

This study employs a qualitative approach with a descriptive-comparative method aimed at analyzing and comparing the implementation of the Teach Less, Learn More (TLLM) approach in Singapore and the Kurikulum Merdeka in. The qualitative approach was chosen because it enables the researcher to describe educational phenomena in depth [34]. The descriptive-comparative design allows the researcher to outline the characteristics of each context and then compare them [35]. This study adopts a cross-national comparative design, which is used to compare two different education systems [35]. In the first stage, the researcher conducted an initial literature review to examine theories of critical thinking, 21st-century pedagogy, and education policies in Singapore and Indonesia. The review covered scholarly journals, policy reports, and curriculum documents,

including the Teach Less, Learn More (TLLM) document from the Ministry of Education Singapore [18] and the Kurikulum Merdeka issued by the Indonesian Ministry of Education, Culture, Research, and Technology [27]. The findings were used to strengthen the theoretical foundation, define the research focus, and develop data collection guidelines. The second stage involved field data collection through semi-structured interviews, classroom observations, and document analysis. The third stage focused on thematic data analysis and the construction of a comparative narrative on the implementation of TLLM and the Kurikulum Merdeka in developing students' critical thinking.The participants consisted of seven individuals representing the implementation contexts of TLLM in Singapore and the Kurikulum Merdeka in Indonesia.

Data collection used three techniques: semi-structured interviews, classroom observation, and document analysis. First, semi-structured interviews explored teachers' and principals' perceptions, strategies, and experiences in implementing critical thinking-oriented instruction in primary education [38]. This method allowed flexible questioning while remaining focused on the research questions. Second, classroom observations, conducted both in person and online, gathered empirical data on the implementation of TLLM and the Kurikulum Merdeka, focusing on teaching practices, teacher–student interaction, and educational technology use [39]. Third, document analysis examined the policy foundations and pedagogical principles underlying each system, including curriculum guidelines, policy reports, and related academic publications [37].Data analysis was conducted using thematic analysis, which is considered effective for systematically identifying patterns of meaning within qualitative data [40]. The analytical process consisted of six main stages: first, data familiarization through repeated reading of interview transcripts, observation notes, and policy documents; second, generating initial codes by marking data segments relevant to the research focus, such as teachers' strategies in posing higher-order questions, designing authentic tasks, or facilitating student reflection; third, theme identification by grouping codes into broader categories of meaning; fourth, theme review to ensure coherence among themes and their alignment with the contexts of both countries; fifth, theme naming so that each theme has a clear focus and meaning; and sixth, interpreting the findings by linking them to theories of critical thinking and education policies in Singapore and Indonesia [5].

3. Results

The analysis of classroom observations and in-depth interviews reveals significant pedagogical changes within Singapore's Teach Less, Learn More (TLLM) framework and Indonesia's Kurikulum Merdeka. The findings show that critical thinking is not merely a result of curriculum reform, but a deliberate instructional design involving content prioritization, structured argumentation, and metacognitive reflection. In Singapore, teachers demonstrate strong pedagogical fluency by streamlining the syllabus to focus on "big ideas" and conceptual debates that promote analytical depth [42]. In Indonesia, although teachers have embraced the Kurikulum Merdeka, implementation often faces tension between inquiry-based learning and pressure to complete content coverage. Nevertheless, the Profil Pelajar Pancasila projects provide opportunities to contextualize critical thinking through local issues such as environmental sustainability and social ethics [44].

A major distinction lies in the scaffolding used during classroom interaction. Singaporean classrooms consistently apply the "Claim–Evidence–Reasoning" (CER) model to encourage evidence-based justification rather than factual recall [46]. In contrast, dialogic learning in Indonesia remains varied and evolving. Some teachers successfully use probing questions to challenge linear thinking, while others still encounter a "culture of silence" where students depend on teachers for the "correct" answer [50]. Metacognitive reflection has also become a routine closing activity in Singapore, whereas in Indonesia it is often treated as optional and omitted due to time constraints [52].

In Singapore, critical thinking is strengthened through Professional Learning Communities (PLCs), where teachers collaboratively refine probing techniques and share inquiry-based learning practices [58]. This supports a consistent culture of higher-order thinking. In Indonesia, however, teachers often work in fragmented professional environments where implementation of the Kurikulum Merdeka depends heavily on individual initiative and school leadership [59]. As a result, interpretations and assessments of critical thinking vary across regions despite existing examples of strong practice.

Singaporean classrooms also integrate digital platforms as "thinking tools" that help students visualize reasoning, map arguments, and provide peer feedback in real time [60]. Technology therefore functions as a scaffold for self-regulation and peer evaluation. In Indonesia, digital tools are

increasingly used, but mainly for content delivery and administration rather than complex critical interaction. This indicates an important area for development, as effective technology use could help teachers manage large classrooms while supporting structured critical discourse [61].

Another emerging finding is the connection between critical thinking and national character in Indonesia, a relationship less emphasized in Singapore's more pragmatic system. In Indonesia, critical thinking is linked to Gotong Royong (mutual cooperation), encouraging students to solve community problems and uphold social justice [62]. This socially situated approach aligns with Education for Sustainable Development (ESD) by fostering collective responsibility. In contrast, Singapore tends to frame critical thinking as a tool for economic competitiveness and personal resilience in a globalized world [63]. Although both systems promote higher-order thinking, Indonesia offers a distinctive model that integrates critical thinking with moral and national identity, supporting long-term social resilience in a diverse society.

Table 1. Comparative Analysis of Critical Thinking Pedagogies

Pedagogical Dimension	Singapore (TLLM Framework)	Indonesia (Kurikulum Merdeka)
Content Management	Systematic streamlining; focus on "Big Ideas" and conceptual depth over syllabus breadth [43].	Transitioning; focus on Essential Material, though often hindered by content-coverage anxiety [45].
Instructional Scaffolding	Strict adherence to argumentation structures [46].	Contextual scaffolding via *Profil Pelajar Pancasila* projects; emphasis on local problem-solving [47].
Questioning Patterns	High frequency of "What if" and "How" questions; teachers act as deliberate provocateurs of thought [49].	Increasing use of open-ended questions, though often limited by student dependence on teacher authority [51].
Role of Projects	Authentic tasks focused on data analysis, source reliability, and logical defense of solutions [48].	Multi-disciplinary projects focused on character building and contextual exploration of real-world issues [15].
Reflection (Metacognition)	Integrated "Exit Tickets" and journals focusing on *how* and *why* thinking has shifted during the lesson [52].	Developing; often focused on affective responses (feelings) rather than cognitive strategy reflection [54].
Contribution to Resilience	Intellectual defense against misinformation through rigorous evidence evaluation [57].	Strengthening national identity and social cohesion through collaborative, critical inquiry [55].

The integration of national resilience and sustainability values was also evident in the observed curricula. In Singapore, critical thinking is framed as a survival skill in a globalized economy, whereas in Indonesia, it is increasingly linked to the formation of a resilient national character capable of independent reasoning amid global volatility [56]. Despite these differing motivations, both systems are moving toward a paradigm where the teacher's role is no longer a transmitter of information but a "critical mediator" of student inquiry. The data suggests that for Indonesia to match the systematic rigor of Singapore, there is a need for more explicit instructional rubrics that guide teachers in moderating argumentative discussions and protecting time for metacognitive reflection at the end of each learning cycle [28]. This evolution is essential to ensure that the pedagogical goals of the *Kurikulum Merdeka* translate into a tangible increase in the students' analytical and reflective capacities.

4. Discussion

4.1. Content Streamlining as a Foundation for Sustained Learning

The findings of this study indicate that the successful implementation of critical thinking pedagogy depends not only on curriculum policy, but also on how teachers interpret and manage curriculum content in classroom practice. In Singapore, the Teach Less, Learn More approach provides teachers with a clear pedagogical direction: learning should prioritize conceptual depth, meaningful inquiry, and long-term understanding rather than merely completing a large amount of content. This enables teachers to select essential materials, focus on "big ideas," and design learning activities that encourage students to question, analyze, and evaluate information more deeply [61].

This finding is important because it shows that sustained learning cannot be achieved when classroom instruction is dominated by content coverage. When teachers have the confidence to streamline materials, students gain more time to engage with concepts, connect ideas, and apply knowledge in different contexts. In this sense, Singapore's TLLM approach supports sustained learning by shifting the classroom focus from short-term memorization to deeper intellectual engagement.

In Indonesia, the Kurikulum Merdeka also provides flexibility for teachers to design more meaningful learning experiences. However, the findings suggest that many teachers still experience anxiety about completing the syllabus. This indicates that the main challenge is not only policy design, but also the persistence of traditional pedagogical habits. Even when the curriculum allows flexibility, teachers may return to textbook-oriented instruction because of assessment pressure, administrative demands, or limited professional support [62].

The comparison between Singapore and Indonesia therefore highlights a key finding: curriculum flexibility will not automatically lead to critical thinking or sustained learning unless teachers are supported to use that flexibility effectively. Singapore benefits from a more established professional ecosystem, including Professional Learning Communities, where teachers can collaboratively discuss how to reduce content load while maintaining academic quality [63]. In Indonesia, similar practices still depend largely on individual teacher initiative, which may result in uneven implementation across schools.

Thus, the study shows that sustained learning requires both pedagogical freedom and institutional support. Teachers need not only curriculum autonomy, but also professional training, school leadership, and assessment systems that encourage depth of learning rather than the completion of textbook content. Entrenched pedagogical habits. Although the policy offers flexibility, systemic pressures and traditional teaching practices often push teachers back toward textbook-oriented instruction [62]. Therefore, achieving analytical depth similar to Singapore requires stronger systemic support to reduce administrative pressure and allow teachers to focus on developing higher-order cognitive competencies.

This difference also reflects contrasting professional ecosystems in both countries. Singapore benefits from well-established Professional Learning Communities (PLCs) that enable teachers to share strategies for simplifying content without reducing academic quality [63]. In Indonesia, content streamlining still depends largely on individual teacher initiative, resulting in uneven implementation across schools. This finding highlights that critical thinking reform requires collective support and visionary school leadership to preserve dialogic and reflective learning spaces from administrative curriculum demands.

4.2. Strengthening Argumentation through Structured and Authentic Learning

Another significant finding of this study concerns the role of structured argumentation in developing students' critical thinking. In Singapore, the use of the Claim Evidence Reasoning model demonstrates how critical thinking can be taught systematically. By asking students to make claims, support them with evidence, and explain their reasoning, teachers help students develop disciplined thinking habits. This approach trains students not only to express opinions, but also to justify their ideas logically and evaluate the strength of information [64].

This finding stands out because it shows that critical thinking is not developed through open discussion alone. Students need clear scaffolding to help them organize their thoughts, defend their arguments, and respond to alternative viewpoints. The CER model provides such scaffolding by making the reasoning process visible. As a result, students learn that a good answer is not simply one that sounds correct, but one that can be supported by relevant evidence and logical explanation.

In the Indonesian context, the Profil Pelajar Pancasila projects offer strong potential for developing critical thinking because they connect learning with real-life and local issues. However, the findings suggest that some project-based activities still focus more on producing visible products, such as posters, crafts, or food items, rather than engaging students in deeper analysis [65]. This means that project-based learning may become less effective when the emphasis is placed mainly on creativity or output, without requiring students to investigate problems, analyze data, compare alternatives, or justify their proposed solutions.

Therefore, one of the key implications of this study is that authentic projects must be strengthened with explicit critical thinking indicators. Project assessment should not only evaluate the final product, but also the quality of students' reasoning process. For example, students should be assessed on how they identify problems, gather evidence, test assumptions, evaluate possible solutions, and reflect on the consequences of their decisions. In this way, project-based learning can move beyond activity-based learning and become a powerful tool for sustained intellectual development.

The integration of technology in Singapore also provides an important lesson. Technology is used not merely as a tool for presenting information, but as a medium for supporting reasoning, collaboration, and feedback [66]. Digital platforms can help students visualize their arguments, compare perspectives, and receive responses from peers. For Indonesia, this is particularly relevant

because digital tools may help teachers manage large classrooms and provide more equal opportunities for students to participate in argumentative discussions. This finding suggests that technology should be understood as a "thinking tool," not only as a delivery tool. When used effectively, technology can support sustained learning by allowing students to revise their ideas, track their reasoning, and engage in continuous reflection.

4.3. Metacognitive Reflection and the Development of Strategic Awareness

The third major finding of this study is the importance of metacognitive reflection in supporting sustained learning. In Singapore, reflection is not treated as a simple closing activity, but as an essential part of the learning process. Students are encouraged to explain how their thinking changes, why they revise their opinions, and what evidence influences their conclusions [67]. This kind of reflection helps students become aware of their own thinking processes.

This is significant because sustained learning requires students to understand not only what they learn, but also how they learn. When students are able to reflect on their reasoning, they become more capable of monitoring their understanding, identifying weaknesses in their arguments, and improving their learning strategies. In other words, metacognition transforms students from passive recipients of information into active and independent learners.

In Indonesia, reflective activities are also present, especially within the spirit of Kurikulum Merdeka. However, the findings indicate that reflection often remains affective, focusing mainly on students' feelings or personal impressions. While affective reflection is important, it needs to be developed further into cognitive reflection. Students should be guided to reflect on their thinking strategies, decision-making processes, and the reasons behind their answers [68].

This distinction is important. A student may be able to produce a correct answer without fully understanding the reasoning behind it. However, sustained learning occurs when students can explain why an answer is reasonable, how they arrived at it, and how the same reasoning can be applied to new problems. Therefore, cognitive reflection should become a more explicit part of classroom practice in Indonesia.

The connection between metacognition and Education for Sustainable Development is also important. ESD requires students to deal with complex issues such as environmental sustainability, social justice, and responsible resource use. These issues cannot be solved through memorized knowledge alone. Students need the ability to examine assumptions, consider multiple perspectives, evaluate long-term consequences, and make ethical decisions. Metacognitive reflection supports these abilities by helping students become more aware of the values, biases, and reasoning processes behind their decisions.

Overall, the findings show that critical thinking pedagogy becomes more meaningful when it is connected to sustained learning. Singapore demonstrates how content streamlining, structured argumentation, and metacognitive reflection can work together to create deeper and more lasting learning experiences. Indonesia, meanwhile, shows strong potential through Kurikulum Merdeka and the Profil Pelajar Pancasila, but its implementation needs stronger support in the form of teacher training, assessment reform, and clearer classroom strategies.

The comparative insight from this study is that sustained learning does not emerge simply from reducing content, using projects, or asking students to reflect. It emerges when these elements are intentionally connected: teachers reduce excessive content to create space for inquiry, students use evidence to build arguments, and reflection helps them internalize what and how they have learned. This integrated process is what makes critical thinking pedagogy more powerful, more engaging, and more relevant for preparing students to face complex challenges in the 21st century.

5. Conclusion

This study concludes that there is a strong alignment between the theoretical expectations outlined in the introduction and the pedagogical realities observed in the results and discussion. While both Singapore through Teach Less, Learn More (TLLM) and Indonesia through Kurikulum Merdeka have successfully established normative frameworks for critical thinking, their classroom actualization differs in systematic rigor. Singapore's success is anchored in a disciplined pedagogical culture of content streamlining and structured argumentation (CER), whereas Indonesia's strength lies in the contextualization of critical reasoning through social and character-building projects. These findings confirm that the strategic integration of critical thinking pedagogies is fundamental to achieving the goals of Education for Sustainable Development (ESD) and strengthening National

Resilience, as it equips students with the analytical filters necessary to navigate global uncertainty and misinformation.

The prospects for future research should focus on the development of standardized yet culturally-sensitive instructional rubrics that can assist teachers in Indonesia to more effectively moderate argumentative discussions and cognitive reflection. Further studies are also recommended to examine the long-term impact of these critical thinking models on students' decision-making behaviors regarding environmental and social sustainability issues. By strengthening the professional ecosystem for teachers particularly through localized learning communities the gap between curriculum policy and classroom practice can be bridged, ensuring that critical thinking becomes an enduring pillar of national human capital development in both nations.

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Informed Consent

The protection of privacy is a legal right that must not be breached without individual informed consent. In cases where the identification of personal information is necessary for scientific reasons, authors should obtain full documentation of informed consent, including written permission from the patient prior to inclusion in the study. Incorporate the following (or a similar) statement: We have obtained informed consent from all individuals included in this study.

Ethical Approval

We have obtained informed consent from all individuals included in this study. Written permission was secured from the participants (and parents/guardians, given the subjects are primary school students) prior to the interview and observation sessions, ensuring their privacy and anonymity throughout the research process.

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