



COMPARATIVE STUDY OF CONTEXT-BASED SCIENCE CURRICULUM IN INDONESIA AND MALAYSIA

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Abstract

This study examines the characteristics and approaches of context-based science curricula in Indonesia and Malaysia through a qualitative descriptive-comparative design. The study aims to identify curriculum orientations, forms of contextual integration, and differences in structural implementation between the two education systems. Data were collected through document analysis of official national science curriculum frameworks and supported by relevant scholarly literature. The findings indicate that both countries adopt a context-based orientation in science education, emphasizing the connection between scientific concepts and real-life situations. However, differences are found in the depth and structure of contextual integration. The Indonesian curriculum demonstrates greater flexibility, positioning context primarily as a conceptual linkage adaptable to local conditions. In contrast, the Malaysian curriculum integrates context more systematically within instructional design to strengthen conceptual understanding and application. These findings highlight the importance of balancing contextual relevance and structural coherence in curriculum development. The study contributes to comparative curriculum discourse and provides insights for strengthening context-based science education in diverse educational settings.

Keywords: context-based learning; science curriculum; curriculum comparison; local context integration; Indonesia; Malaysia

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INTRODUCTION

Science education plays a central role in developing students' conceptual understanding, scientific reasoning, and the ability to interpret natural phenomena in everyday life. Contemporary science education no longer emphasizes content mastery alone but prioritizes meaningful learning experiences that connect scientific concepts with real-world contexts (Silaban & Sriyati, 2024). This shift reflects global educational reform trends that advocate for contextual and student-centered approaches to science learning (Masalimova et al., 2024).

Context-based science learning positions real-life situations as the starting point for conceptual development. Through contextual integration, students are expected to relate abstract scientific principles to their social, environmental, and cultural surroundings (Ariffin et al., 2023; Wulansari et al., 2025). Empirical studies demonstrate that contextual approaches enhance scientific literacy and



deepen conceptual understanding (Ismail et al., 2025). Theoretically, this approach aligns with constructivist perspectives, which assert that knowledge is constructed through interaction between prior knowledge and meaningful experiences (Putra, 2024).

Indonesia and Malaysia share geographical proximity and socio-cultural similarities, yet their educational systems are shaped by distinct national policies and curriculum structures. Both countries promote contextual learning principles within their science curricula. However, the structure, emphasis, and level of contextual integration may differ due to variations in curriculum reform trajectories and policy implementation (Mansir et al., 2020; Syafitri et al., 2025).

Previous studies primarily focus on contextual implementation at classroom levels or within a single national system (Marsila et al., 2025; Mumtaz et al., 2025). Comparative studies examining context-based science curricula across national systems remain limited. This gap highlights the need for a descriptive-comparative analysis to understand how contextual principles are structurally embedded within curriculum frameworks in both countries.

Therefore, this study aims to analyze the characteristics of context-based science curricula in Indonesia and Malaysia and to compare their approaches to contextual integration. This comparative perspective is expected to contribute to curriculum development discourse and provide insights for strengthening context-based science education in diverse educational systems.

METHOD

This study employed a qualitative descriptive-comparative design to analyze and compare context-based science curricula in Indonesia and Malaysia. The study did not aim to test hypotheses but to examine curriculum characteristics and contextual integration patterns at the conceptual level.

Data were collected through document analysis and literature review. Primary sources included official national science curriculum documents and instructional guidelines from both countries. Secondary sources consisted of peer-reviewed journal articles published within the last ten years that addressed context-based science learning and curriculum development.

Data analysis was conducted through three stages. First, key principles related to contextual integration were identified from curriculum documents. Second, forms of contextual integration were categorized into environmental, social, cultural, and everyday-life contexts. Third, a comparative analysis was performed to identify similarities and differences in curriculum orientation, structure, and level of contextual integration. The findings were then interpreted using the established conceptual framework.

RESULTS AND DISCUSSION

Characteristics of Context-Based Science Curricula

To obtain a comprehensive overview of the characteristics of context-based science curricula, curriculum documents and relevant literature were examined. The findings are presented using a descriptive-comparative approach to highlight the general characteristics of context-based science curricula in Indonesia and Malaysia.

Table 1. General Characteristics of Context-Based Science Curricula

Aspect of Analysis	Indonesia	Malaysia
Curriculum Orientation	Emphasis on linking scientific concepts with the environment and everyday life	Emphasis on linking scientific concepts with conceptual understanding and application
Role of Context	Context functions as a linkage and illustration of concepts	Context functions as an integral part of instructional strategy
Learning Focus	Conceptual understanding and real-life relevance	Conceptual understanding and application of concepts

Aspect of Analysis	Indonesia	Malaysia
Instructional Approach	Contextual and experience-based learning	Contextual learning with systematic instructional structure

Based on Table 1, science curricula in both Indonesia and Malaysia demonstrate a similar orientation toward context-based learning. Both systems position real-life contexts as essential elements in science instruction. However, differences emerge in the role assigned to context. In Indonesia, context tends to function primarily as a linkage or illustrative element to support conceptual understanding. In contrast, in Malaysia, context is positioned as an integral component of a more structured instructional strategy.

These findings indicate that although both countries adopt context-based orientations, the depth and structural integration of context within curriculum design differ. This distinction reflects variations in curriculum policy frameworks and instructional organization within each national education system.

Integration of Context in Science Curricula

The integration of context in science curricula encompasses environmental, social, cultural, and everyday-life dimensions. The forms of contextual integration within the science curricula of Indonesia and Malaysia are presented in Table 2.

Table 2. Forms of Contextual Integration in Science Curricula

Type of Context	Indonesia	Malaysia
Environmental Context	Natural phenomena and surrounding environmental conditions	Environmental phenomena as examples of concept application
Social Context	Daily community activities	Social activities relevant to scientific concepts
Cultural Context	Local values and practices as learning resources	Local culture as illustrative material in instruction
Everyday Life	Used to clarify concepts	Used to strengthen conceptual understanding

Table 2 indicates that contextual integration in both countries includes relatively similar types of context. The distinction lies in the emphasis and instructional use of context. In Indonesia, environmental and everyday-life contexts are more frequently employed as conceptual linkages. In Malaysia, context is applied in a more directed manner to reinforce and deepen students' understanding of scientific concepts.

These findings suggest that while both education systems recognize the importance of contextual integration, differences emerge in instructional emphasis and curriculum structuring. Indonesia tends to emphasize contextual relevance, whereas Malaysia appears to integrate context more systematically as part of concept reinforcement strategies.

Comparison of Context-Based Science Curriculum Approaches

To identify differences in context-based science curriculum approaches in Indonesia and Malaysia, the comparative findings are presented in Table 3.

Tabel 3. Perbandingan Pendekatan Kurikulum Sains Berbasis Konteks

Comparative Aspect	Indonesia	Malaysia
Level of Contextual Integration	Varies depending on instructional context Supports conceptual understanding	Relatively structured Embedded within instructional design
Position of Context	High and adaptive	Adjusted to learning objectives
Flexibility of Use	Enhancing relevance to local contexts	Strengthening conceptual understanding and application
Direction of Development		

Based on Table 3, the primary difference between the science curricula of Indonesia and Malaysia lies in the level of integration and the positioning of context within instruction. The Indonesian science curriculum demonstrates greater flexibility in the use of context, allowing adaptation to specific classroom and local conditions. In contrast, the Malaysian science curriculum reflects a more structured integration of context within instructional design.

These differences indicate that although both systems adopt context-based orientations, Indonesia emphasizes contextual relevance and adaptability, whereas Malaysia emphasizes systematic integration to support conceptual mastery and application.

Discussion

The findings indicate that science curricula in Indonesia and Malaysia both adopt context-based learning approaches as part of efforts to enhance the relevance and meaningfulness of science education. This result confirms global trends in science education that position real-life contexts as a primary linkage between scientific concepts and students' lived experiences (Wardana et al., 2024; Marsila et al., 2025). The contextual orientation observed in both curricula reflects a paradigm shift from content-centered instruction toward learning that emphasizes conceptual understanding and its connection to reality (Mumtaz et al., 2025). From a theoretical perspective, this shift aligns with constructivist views, which assert that conceptual understanding is constructed through interaction between prior knowledge and meaningful learning experiences (Putra, 2024).

Despite sharing a similar orientation, the findings reveal differences in how context is integrated into the science curricula of Indonesia and Malaysia. In Indonesia, context tends to function as a linkage and illustration of concepts. This approach provides substantial flexibility for educators to adapt learning contexts to local environmental and cultural conditions (Syafitri et al., 2025). Such flexibility supports adaptive instruction that responds to diverse student backgrounds and regional characteristics.

In contrast, the Malaysian science curriculum demonstrates a more structured integration of context within instructional design. Context functions not only as illustrative material but also as a deliberate component of instructional strategy aimed at supporting conceptual understanding and application (Syafitri et al., 2025; Arnab et al., 2025). This approach reflects a systematic effort to ensure that context is consistently aligned with learning objectives.

These differences do not indicate the superiority of one curriculum system over the other. Rather, they reflect variations in strategies for integrating context into science learning. From a curriculum development perspective, such variation offers opportunities for mutual enrichment. The contextual flexibility observed in Indonesia may be complemented by the more systematic integration evident in Malaysia (Mumtaz et al., 2025; Marsila et al., 2025).

The integration of environmental, social, cultural, and everyday-life contexts in both curricula underscores the recognition of local context as a critical element in science learning (Fathiyah & Muflih, 2023). Local context serves as a bridge that connects scientific concepts with students' lived realities, reducing the perception of science as abstract and detached knowledge.

Within the current state of the art in science education, these findings reinforce previous research emphasizing the importance of context-based learning in enhancing relevance and meaningfulness (Wardana et al., 2024; Syafitri et al., 2025). Moreover, this study demonstrates that cross-national comparative analysis contributes to a broader understanding of variations in context-based science curriculum implementation across education systems. Conceptually, this study provides a foundation for developing more integrated and locally responsive context-based science learning. The general principles identified from both curricula can guide the design of science instruction that prioritizes not only conceptual mastery but also meaningful connections to students' real-life experiences (Wardana et al., 2024; Arnab et al., 2025; Mumtaz et al., 2025).

CONCLUSION

Based on the findings of the study, it can be concluded that the integration of local wisdom in science learning is positively perceived by students in Indonesia and Malaysia. Students consider the linkage between science content and local contexts, such as the natural environment, culture, and surrounding social life, to enhance the relevance of science learning to their experiences. The findings also indicate that students perceive local wisdom as an element that supports contextual understanding of scientific concepts. The integration of local context is viewed as facilitating connections between scientific concepts and everyday realities, although the form and level of integration may be perceived differently in each country. Overall, this study demonstrates that science learning grounded in local wisdom receives favorable acceptance from students' perspectives. These findings highlight that students' perceptions constitute an important consideration in the development of contextual and locally responsive science instruction.

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