

Value-Based Pedagogical Transformation through the Integration of Pure Science and Local Wisdom into the Learning Curriculum at Madrasah Ibtidaiyah Al-Amin Purwakarta

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Abstract: Educational transformation in the digital era often prioritizes global scientific standards, potentially marginalizing local wisdom and character education. Consequently, integrating pure science, Islamic values, and local wisdom is crucial for balancing these elements and fostering a generation that is intellectually astute yet deeply rooted in its cultural identity. This study aims to analyze in depth the integration of pure science and local wisdom within the curriculum, examine the accompanying value-based pedagogical transformation, and identify the challenges and opportunities regarding its implementation at Madrasah Ibtidaiyah (MI) Al-Amin Purwakarta. The study employs a qualitative approach using an ethnographic research design. The findings reveal that MI Al-Amin Purwakarta implements this integration by aligning pure science content with local traditional practices. This synthesis has successfully catalyzed a pedagogical shift from an instructive approach to one that is participatory and reflective, effectively internalizing values of social and environmental piety, such as the concept of **Khalifah fil Ardh** (steward of the earth). Although challenges exist—specifically limited specialized teaching materials and heavy curricular workloads for educators—these can be mitigated by optimizing collaboration between the school and the local community. Theoretically, this study enriches the literature on ethnosience-based transformative pedagogy; practically, it offers recommendations for contextual curriculum design to policymakers and educators.

Keywords: Local Wisdom, Pure Science, Pedagogical Transformation, Value-Based Education, Ethnosience.

Introduction

The transformation of the education sector in Southeast Asia currently faces a complex spectrum of challenges within a dynamic digital era. The demand to produce globally competitive human resources often results in the marginalization of the preservation of noble values and local wisdom—elements that constitute the essence of a nation's cultural identity. This phenomenon is manifested in curriculum structures that predominantly adopt a pure science paradigm, thereby leaving limited space for integrating cultural richness and indigenous wisdom. Value-oriented education has become imperative as a balancing instrument to ensure that technological advancement does not erode cultural foundations (Reimers, 2020). Indonesia, possessing the largest body of cultural and ethnic diversity in Southeast Asia, also grapples with the dilemma of national curriculum standardization, which frequently overlooks the potential of local wisdom. Within the framework of primary education, Madrasah Ibtidaiyah (MI) Al-Amin Purwakarta strives to integrate Islamic values with the national curriculum. However, the institution still faces the challenge of realizing a transformative pedagogy capable of harmonizing the rigor of the pure science paradigm with the depth of local wisdom, aiming to produce graduates who are both scientifically competent and possess noble character (Suri and Chandra, 2021).

Based on this background, the research problems are formulated as follows: (1) How is the integration of pure science and local wisdom implemented within the learning curriculum at MI Al-Amin Purwakarta? (2) How can a value-based pedagogical transformation process be realized through the integration of pure science and local wisdom at MI Al-Amin Purwakarta? (3) What are the obstacles and potentials encountered in applying a value-based pedagogical model that integrates pure science and local wisdom at MI Al-Amin Purwakarta? Various prior studies underscore the importance of internalizing cultural and moral values within the curriculum to enhance the quality of learning and strengthen students' local identities (Lestari et al., 2024; Cahya and Syafrizal, 2022). Research in the field of Islamic education indicates that educational institutions in Southeast Asia have proactively developed holistic-integrative curriculum frameworks that combine religious knowledge with the sciences (Nasir and Rijal, 2021; Suri and Chandra, 2021). From a methodological perspective, the ethnographic approach has proven relevant and is widely adopted to analyze the interplay between science, values, and local wisdom (Yunkaporta, 2023; Liu et al., 2022). Specific studies on the Integrated Islamic Basic Education model also highlight the urgent need to design a curriculum that strikes a balance between religious disciplines and the sciences (Malik et al., 2022; Jamil and Jaffar, 2023).

While existing literature continues to examine the integration of science, values, and local wisdom, most studies tend to focus on these aspects in isolation. There remains a substantial epistemological gap regarding comprehensive, holistic ethnographic studies on value-based pedagogical transformation within Islamic-based primary schools—specifically those integrating pure science and local wisdom—in Southeast Asia. This research

aims to: (1) analyze in depth the implementation of integrating pure science and local wisdom within the instructional curriculum framework at MI Al-Amin Purwakarta; (2) comprehensively examine the process of value-based pedagogical transformation resulting from this integration at the institution; and (3) identify and elaborate on the challenges and opportunities arising from the application of this value-based pedagogical model at MI Al-Amin Purwakarta.

This study has the potential to contribute to the development of contemporary pedagogical theory regarding value-based education and curriculum integration in Southeast Asia (Silova et al., 2020). It also seeks to test the relevance of global educational theories when applied in a local context to address 21st-century challenges (Reimers, 2020). The findings are expected to provide substantive recommendations for Islamic-based primary schools (particularly MI Al-Amin Purwakarta) regarding curriculum design and instructional strategies. Furthermore, the results will serve as a guide for educators on leveraging local wisdom and provide empirical data to assist policymakers in formulating adaptive and inclusive educational policies (Suri and Chandra, 2021).

Method

This study employs a qualitative approach, specifically utilizing an ethnographic method. This design was selected to conduct an in-depth exploration of the phenomenon of value-based pedagogical transformation, as well as the process of integrating pure science with local wisdom within the natural setting of an educational institution. The research is grounded in the interpretivist paradigm, which emphasizes subjective understanding and the construction of meaning by participants through their social interactions within the school environment.

The study was conducted at MI Al-Amin Purwakarta, located in Kampung Cibangala, Cijati Village, Maniis District, Purwakarta Regency. Purposive selection was used to choose both the location and the participants, as MI Al-Amin Purwakarta is considered representative of the synergy between pure science and local wisdom. Key participants in this study included school leadership, teachers from various grade levels, students, and parent representatives who understand the institution's educational philosophy. The number of participants was not rigidly fixed at the outset; instead, the study followed the principle of data saturation, whereby data collection ceased when the information obtained no longer yielded substantial new insights.

In this qualitative study, the researcher served as the primary data collection instrument (human instrument). To ensure the depth and richness of the data, collection was carried out using three main techniques: (1) Participant Observation: The researcher engaged directly and proportionately in daily school activities—both inside and outside the classroom—to observe the learning process, teacher-student interactions, and value-based educational practices without disrupting the school's natural dynamics. (2) In-depth Interviews: Conducted individually with key participants using open-ended and flexible interview guidelines to comprehensively explore their perceptions, experiences, and viewpoints. (3) Document Study: Involving the collection and analysis of relevant school documents, such as the curriculum, lesson plans, learning modules, textbooks, and student work. Data analysis is an iterative and continuous process—spanning from fieldwork to report preparation—guided by the interactive analysis framework of the Miles and Huberman model. The analysis stages comprise: (1) Data Reduction: Selecting, focusing, and simplifying raw data from observations, interviews, and documents to identify relevant themes and patterns. (2) Data Display: Presenting the reduced data in the form of a rich, holistic descriptive narrative to facilitate understanding of the phenomenon under study. (3) Conclusion Drawing and Verification: Drawing preliminary conclusions that are subsequently verified consistently in the field to ensure the accuracy of interpretations.

To ensure the credibility of the research findings, various techniques for verifying data validity were employed. The researcher comprehensively applied triangulation, encompassing source triangulation (comparing information across informants), method triangulation (cross-referencing data from observations, interviews, and documentation), and theory triangulation. Furthermore, data validity was reinforced through member checks to confirm the alignment between the researcher's interpretations and the participants' intended meanings, prolonged engagement in the field, and peer debriefing.





Figure. Research Location

Results and Discussion

1. Implementation of the Integration of Pure Science and Local Wisdom

MI Al-Amin Purwakarta has integrated pure science and local wisdom by selecting learning materials relevant to natural phenomena and the local community's context. In Natural Science lessons, the concept of the water cycle is not merely explained theoretically but is directly linked to the local wisdom practices of the Maniis community regarding water resource management, such as spring preservation traditions. Educators design activities that align scientific concepts with local practices—for instance, by guiding students to identify traditional medicinal plants in the surrounding environment while simultaneously learning their biological classification. However, variations in the level of integration among educators were observed; some teachers are highly proactive in developing materials, while others make only minimal local modifications due to the absence of structured guidelines.

2. Value-Based Pedagogical Transformation

This integration has triggered a shift in teaching methods from a purely instructive approach to one that is more participatory, reflective, and oriented toward character building. Teachers have transformed into facilitators who internalize fundamental values (honesty, environmental awareness, accountability) inherently through science materials grounded in local wisdom. Evaluation methodologies have also expanded; assessment is no longer limited to cognitive understanding of science but encompasses the observation of students' daily behavior, participation in discussions on local issues, and affective reflection.

3. Implementation Challenges and Opportunities

Key challenges include limited resources (specific teaching materials), a heavy curriculum workload, and the expectations of some parents who prioritize academic achievement in standard pure science. Identified opportunities include a high level of institutional awareness regarding the urgency of value-based education and the wealth of cultural resources in Citapen, which can be optimized through collaboration with traditional leaders or local communities.

4. Contextualizing Learning Through Ethnoscience

The integration implemented by MI Al-Amin Purwakarta demonstrates that pure science disciplines and local wisdom are not mutually exclusive entities but can be synergized. The practice of linking biology or physics content with the local wisdom of the Citapen community aligns with contextual learning strategies that utilize traditional ecological knowledge. This confirms previous studies indicating that ethnoscience values can enhance scientific understanding while simultaneously strengthening students' appreciation of their cultural heritage. However, disparities in the success of this integration among teachers highlight the need for comprehensive guidelines to ensure that value-based learning objectives are realized consistently, as emphasized by Fitriyawany et al. (2022).

5. Pedagogical Transformation and Value Internalization

Empirical findings indicate that integrating local knowledge into the science curriculum acts as a catalyst for a shift in pedagogical paradigms. The learning process becomes more meaningful because the subject matter is linked to the students' real-life experiences. This transformation also facilitates the internalization of Islamic

values. Science instruction at MI Al-Amin Purwakarta has proven capable of translating cognitive understanding into social and spiritual piety—for instance, through the inculcation of the concept of *Khalifah fil Ardh* (steward/leader on earth), which emphasizes the importance of environmental preservation. This shift from cognitive assessment toward behavioral and affective evaluation aligns with the findings of Tohri et al. (2022) and Elan et al. (2022), which underscore the effectiveness of local wisdom in fostering character development at the primary education level.

6. Strategies to Mitigate Implementation Challenges

Obstacles such as parental perceptions and the pressure of the curriculum workload highlight the complexities of implementing the curriculum in the field. To mitigate these issues, schools can optimize the involvement of local communities and traditional leaders as collaborators. This approach not only enriches the content of teaching materials—thereby compensating for limited school resources—but also strengthens the foundation of value-oriented teaching methods through what Lahmar (2020) terms a "wisdom-based cultural environment." Theoretically, these findings demonstrate that education in the era of globalization need not sacrifice local identity; rather, local wisdom serves as an essential instrument for enriching the global curriculum.

Conclusion

This study concludes that MI Al-Amin Purwakarta has endeavored to implement value-oriented education by integrating pure science with local wisdom. This implementation is tangibly realized through the design of learning materials and activities that harmonize global scientific concepts with traditional practices and the local community's ecological knowledge, thereby enriching students' understanding while fostering an appreciation for cultural heritage. The synthesis of these two knowledge domains has proven capable of catalyzing a significant pedagogical transformation. The teaching paradigm has shifted from a mere knowledge-transfer orientation toward an approach that is more holistic, participatory, and reflective. Through this transformation, moral values, environmental responsibility, and Islamic spirituality—such as the implementation of the *Khalifah fil Ardh* (Steward of the Earth) concept—have been successfully internalized within the science learning process. Science education is no longer confined to the cognitive realm but has become an essential medium for cultivating spiritual and social piety. Although this integration effort faces several empirical challenges—such as limited specific teaching materials, time constraints, and teachers' curricular workloads—the institution possesses substantial potential for resolving these issues. The institution's character-oriented development, the rich culture of the Citapen community, and the optimization of synergistic collaboration among the school, parents, and local customary leaders serve as a solid foundation to ensure the sustainability of this transformative pedagogical model. Theoretically, this study affirms that in the face of globalization's dynamics, relevant education is that which bridges modern science with efforts to preserve the wealth of local wisdom.

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