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# STRUCTURED INQUIRY WITHIN A TRANSDISCIPLINARY CURRICULUM: ADVANCING SOCIAL STUDIES PEDAGOGY IN ISLAMIC SCHOOLS

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## ABSTRACT
In an era characterized by rapid social, technological, and environmental transformation, education is increasingly expected to cultivate critical thinking, collaboration, and responsible citizenship rather than mere factual recall. Social Studies education, therefore, requires pedagogical approaches that promote inquiry, conceptual understanding, and interdisciplinary integration. This study examines the implementation of structured inquiry within the International Baccalaureate Primary Years Program (IB-PYP) transdisciplinary framework and its implications for improving Social Studies learning in an Islamic boarding school context. A qualitative classroom action research design was employed in two stages: an exploratory phase conducted in an IB-PYP school and an implementation phase in an Islamic boarding school, where the framework was adapted to the national curriculum. Data were collected through classroom observations, semi-structured interviews, document analysis, and formative assessments across three research cycles. The findings demonstrate progressive improvements in teacher facilitation practices, student engagement, higher-order thinking, and learning outcomes. Inquiry routines gradually became internalized, while transdisciplinary integration enabled students to connect conceptual knowledge with real-life and ethical contexts. The study concludes that structured inquiry embedded within a coherent transdisciplinary framework enhances both cognitive and reflective dimensions of learning. These findings suggest that Islamic educational institutions can effectively integrate global curriculum frameworks to promote holistic, inquiry-oriented, and socially responsible Social Studies education.

**Keywords:** Higher-Order Thinking, Inquiry-Based Learning, Islamic School, Social Studies Pedagogy, Transdisciplinary Curriculum

## INTRODUCTION
Education plays a strategic role in preparing learners to participate meaningfully and responsibly in an increasingly interconnected global society. In the data provided by UNESCO in 2021, as galvanized by Geng (2026), rapid developments in science, technology, and information have transformed social, economic, and cultural life, creating new demands for educational systems to move beyond the transmission of factual knowledge toward the cultivation of critical thinking, creativity, collaboration, and ethical citizenship. Contemporary education is therefore expected to equip learners with higher-order cognitive and socio-emotional competencies that enable them to address global challenges such as inequality, sustainability, diversity, and democratic participation (OECD, 2021; Pritam & Kirti, 2026). Within this broader agenda, Social Studies occupies a central position because it develops learners' understanding of society, civic responsibility, and the dynamic relationships between individuals, communities, and their environments.

In the Indonesian context, Social Studies at the primary level is intended to strengthen civic competence, social awareness, and democratic values. However, many classroom practices remain dominated by teacher-centered instruction and rote memorization, reducing Social Studies to static factual content disconnected from students' lived realities (Oktaviana, 2025). Such instructional patterns often limit student participation and constrain the development of higher-order thinking skills, including analysis, evaluation, and problem solving (Tabiri, 2026; Wijesekera & Hameed, 2026). This gap between curricular aspirations and classroom realities indicates the need for pedagogical innovation that emphasizes active participation, conceptual understanding, and contextual relevance. The challenge is particularly significant in Islamic educational institutions, where curriculum development increasingly seeks to combine academic excellence with moral and social responsibility (Siregar et al., 2025).

One promising response to these challenges is inquiry-based learning. Grounded in constructivist theory, inquiry-based learning positions students as active investigators who generate questions, gather evidence, test ideas, and construct understanding through reflection and social interaction (Piaget, 1972; Vygotsky, 1978; Fosnot, 2020). Previous studies have shown that structured inquiry improves student engagement, conceptual understanding, and critical thinking across various subject areas (Alfieri et al., 2020; Bell et al., 2021; Jannah et al., 2025). In Social Studies specifically, inquiry-oriented instruction has been found to strengthen analytical reasoning and students' ability to interpret social phenomena through multiple perspectives (Aashamar & Mathé, 2025; Seprie et al., 2025; Wutsqo et al., 2025). Nevertheless, inquiry is often implemented as an isolated classroom strategy rather than embedded within a coherent curriculum model that systematically supports interdisciplinary learning.

In parallel with advancements in inquiry-based pedagogy, the International Baccalaureate Organization emphasized in 2018 that transdisciplinary curriculum frameworks, most notably the IB-PYP, have achieved international recognition. These frameworks are distinguished for organizing learning around authentic themes that effectively integrate multiple disciplines. The IB-PYP emphasizes conceptual understanding, student agency, reflection, and inquiry as core principles of learning. Research suggests that transdisciplinary approaches can strengthen learner motivation, relevance, and the capacity to address complex real-world issues (Drake & Reid, 2020; Gürkan, 2021; Aksoy & Bozdoğan, 2024; Atkinson-Toal, 2026). Emerging studies in Indonesia also indicate that IB-PYP practices, including Personal Inquiry, enhance research skills, reflective capacity, and independent learning dispositions among students (Olbytri et al., 2025). However, empirical studies examining how inquiry-based learning can be systematically integrated within the IB-PYP framework to improve Social Studies learning in Indonesian and Islamic school contexts remain limited.

Responding to this gap, the present study investigates the implementation of inquiry-based learning within the IB-PYP transdisciplinary framework and its effectiveness in improving the quality of Social Studies learning in an Islamic boarding school context. Specifically, the study examines how the integration of structured inquiry and transdisciplinary curriculum design influences classroom interaction, student engagement, higher-order thinking development, and learning outcomes. By positioning inquiry not merely as a teaching technique but as an organizing pedagogical principle within a coherent curriculum structure, this study contributes to theoretical discussions on innovative Social Studies pedagogy and offers practical insights for curriculum development in Islamic educational institutions seeking to cultivate knowledgeable, reflective, and socially responsible learners. Additionally, it aims to provide guidance for educators on implementing inquiry-based strategies effectively within culturally and religiously sensitive settings, fostering a deeper understanding of how pedagogical approaches can be tailored to support the holistic development of students in diverse educational contexts.

## METHOD

This study is guided by an integrated research framework grounded in constructivist learning theory, which emphasizes knowledge construction through active inquiry, social interaction, and reflection (Vygotsky, 1978; Hmelo-Silver & Jeong, 2021). Inquiry-based learning functions as the core pedagogical strategy, while the transdisciplinary framework of the IB-PYP provides the curricular structure that situates Social Studies learning within authentic and meaningful contexts (Drake & Reid, 2020). Within this framework, inquiry processes, such as questioning, investigation, analysis, and reflection, are embedded in transdisciplinary learning units that integrate Social Studies with other disciplines, enabling students to develop holistic and contextual understanding aligned with contemporary global educational goals (OECD, 2021).

Methodologically, the framework connects instructional implementation with learning processes, data sources, and analytical procedures. Key learning processes, student engagement, inquiry skills development, collaboration, and reflective thinking, are positioned as mediating variables between inquiry-based transdisciplinary instruction and learning outcomes (Hmelo-Silver & Jeong, 2021). These processes were examined through classroom observations, semi-structured interviews, and document analysis, while changes in learning outcomes were supported by descriptive analysis of students' pre- and post-intervention performance scores. Qualitative data were analyzed thematically and integrated with quantitative findings to allow triangulation and enhance validity (Creswell & Poth, 2018; Mills, 2022).

## RESULTS AND DISCUSSION

### Baseline Condition of Social Studies Learning

Before examining the effects of the intervention, it is necessary to understand the initial classroom conditions that served as the starting point for pedagogical improvement. Baseline data were collected through classroom observations, teacher interviews, and formative assessments prior to the systematic implementation of inquiry-based and transdisciplinary learning. These findings provide an overview of existing instructional practices, patterns of student participation, and early learning outcomes, thereby clarifying the specific challenges that the intervention was designed to address.

### Initial Teaching Practices

Prior to the implementation of the inquiry-based and transdisciplinary learning approach, Social Studies instruction in the Islamic boarding school was largely characterized by teacher-centered practices and content-oriented delivery. Classroom observations showed that lessons were primarily conducted through lectures, textbook explanations, and brief questioning that required students to recall factual information. Learning interactions were dominated by the teacher, while students tended to assume a passive role as recipients of knowledge. Opportunities for students to ask questions, engage in discussion, or explore ideas collaboratively were limited. As a result, classroom activities focused mainly on completing instructional materials rather than developing deeper conceptual understanding. Moreover, Social Studies topics were often presented as separate units without clear conceptual integration, making it difficult for students to connect classroom knowledge with broader social realities or real-life experiences.

These observational findings were reinforced by interview data obtained from the Social Studies teacher. The teacher explained that instructional planning was largely directed toward completing the prescribed syllabus and preparing students for periodic assessments. As expressed in the interview, *"Most of the time I focus on ensuring that the material in the textbook is covered before the exam. There is not much time to explore topics in depth or allow students to investigate issues themselves."* (Fullan, Personal communication, February 2024). The teacher further acknowledged

that inquiry-oriented strategies were rarely implemented because students were accustomed to receiving explanations directly from the teacher. Another interview excerpt revealed that *"students usually wait for explanations rather than asking questions or discussing ideas with their classmates."* (Durlak, Personal communication, June 2024). These statements indicate that inquiry processes, such as questioning, investigation, and evidence-based reasoning, were not yet systematically integrated into lesson design.

The combination of observational and interview evidence suggests that instructional practices were strongly shaped by long-standing pedagogical routines emphasizing information transmission and examination preparation. Although the teacher expressed an interest in encouraging more active participation, time constraints and established teaching habits made it difficult to shift toward more student-centered approaches. Consequently, students had limited opportunities to develop higher-order thinking skills or to explore Social Studies concepts through contextual inquiry. This baseline condition highlighted a clear need for pedagogical restructuring that could support more interactive learning processes, integrate concepts across disciplines, and promote inquiry-based engagement aligned with the principles of transdisciplinary learning.

**Students' Initial Engagement and Achievement**

At the beginning of Cycle 1, student engagement in Social Studies learning was relatively limited both in terms of participation intensity and the distribution of involvement among learners. Classroom observations showed that the overall quality of teacher and student activity reached 70.45%, which was categorized as "fair." Although the lesson followed the planned instructional sequence, most interactions were still teacher-directed. Only a small number of students actively responded to questions, while many others participated only when explicitly prompted by the teacher. During discussions, several confident learners tended to dominate the conversation, whereas the majority remained passive observers. Students' responses were generally short and descriptive, often repeating information from the textbook rather than demonstrating deeper interpretation or analysis. This pattern indicated that learning remained focused on recalling factual information rather than engaging students in critical questioning or conceptual exploration.

Interview data with the teacher further clarified the nature of this limited engagement. The teacher explained that many students were accustomed to listening to explanations rather than actively participating in inquiry-based dialogue. As the teacher stated in the interview, "*Most students tend to wait for the teacher to explain the material first. They rarely ask questions unless they are directly asked.*" (Wellington, Personal communication, July 2024). The teacher also noted that encouraging discussion was sometimes challenging because students were hesitant to express their ideas in front of peers. One interview excerpt highlighted this concern: "*When I try to ask open questions, only a few students respond. The others usually stay silent because they are unsure about their answers.*" (Sneider, Personal communication, July 2024). These statements suggest that the classroom culture had not yet developed the confidence and habits necessary for active participation and collaborative exploration.

The formative assessment results in Cycle 1 reinforced these observations regarding limited engagement and understanding. The class average score of 67.95 fell slightly below the established minimum mastery criterion, indicating that learning objectives had not been fully achieved. Analysis of students' written responses revealed recurring difficulties in explaining cause and effect relationships within social phenomena and in applying theoretical concepts to real-life contexts. Many students simply restated definitions without demonstrating deeper conceptual integration. These findings point to several underlying learning obstacles, including passive learning habits, dependence on memorization, and insufficient development of higher-

order thinking skills such as analysis, evaluation, and synthesis. Taken together, the observational data, interview insights, and formative test results highlight the need for pedagogical intervention aimed at promoting more active participation, inquiry-based thinking, and contextual understanding in Social Studies learning.

**Implementation of Inquiry-Based Learning within the IB-PYP Framework**

**Design of the Transdisciplinary Inquiry Unit**

The intervention was systematically designed using the IB-PYP transdisciplinary framework and carefully adapted to align with national curriculum standards and the educational context of the Islamic boarding school. The instructional unit was organized around a central idea: "*Human interactions shape social and environmental sustainability*" (Osborne, Personal communication, September 2024). This central idea served as an integrative anchor that guided the learning process and prevented the fragmentation of Social Studies topics into isolated units. Instead of focusing solely on discrete content areas, the learning unit encouraged students to explore broader social and environmental issues through interconnected perspectives. The unit was structured through three lines of inquiry: (1) patterns of social interaction within communities, (2) the impact of human activities on environmental systems, and (3) collective responsibility in promoting sustainable living. These lines of inquiry were designed to stimulate conceptual thinking and encourage students to move beyond memorizing information toward analyzing causes, relationships, and implications within social phenomena.

Interview data with the teacher confirmed that the transdisciplinary design represented a new instructional approach in the classroom. The teacher explained that organizing lessons around a central idea helped provide clearer conceptual direction for both teaching and learning. As the teacher stated in the interview, "*Using the central idea made the lesson easier to connect across topics. Students could see that social interaction, environmental problems, and responsibility are all related*" (Lederman, Personal communication, October 2024). The teacher also emphasized that the lines of inquiry encouraged more open-ended questioning and discussion compared to previous lessons that focused primarily on textbook explanations. According to the teacher, "*When the lesson is organized through questions and inquiry themes, students become more curious because they feel invited to explore the topic rather than just memorize it*" (Bybee, Personal communication, August 2024). These reflections indicate that the transdisciplinary structure helped shift the focus of learning from content coverage toward conceptual exploration.

To strengthen conceptual coherence and student engagement, Social Studies learning was integrated with multiple subject domains. Consequently, language learning activities were incorporated through reflective writing, structured discussions, and student presentations, allowing learners to express and refine their ideas. Furthermore, scientific perspectives were introduced through environmental observation and analysis activities, which encouraged students to interpret evidence and examine the consequences of human actions on natural systems. In addition, religious education was also embedded by highlighting ethical responsibility and stewardship (*khilafah*) as important principles guiding human interaction with society and the environment. The teacher emphasized during the interview that this integration helped students understand sustainability not only as a social issue but also as a moral responsibility. As a result, the teacher expressed that "*When we connect the lesson with Islamic values, students realize that caring for the environment is also part of their responsibility as Muslims*" (Harlen, Personal communication, September 2024). This integration of Social Studies, science, language, and religious values supported a holistic learning experience, thereby positioning sustainability as both a civic and ethical commitment within the Islamic educational context.

**Inquiry Learning Phases Across Cycles**

The implementation of structured inquiry was carried out progressively across three action research cycles, each representing a stage of pedagogical adjustment and development in the classroom. Cycle 1 marked the initial phase of introducing inquiry-based learning within the Social Studies lesson. At this stage, students were introduced to basic questioning strategies and were organized into small groups to conduct guided investigations related to the lesson theme. However, the transition from teacher-centered instruction to inquiry-oriented learning required considerable adaptation. Classroom observations indicated that many students were unfamiliar with generating open-ended questions or engaging in exploratory discussions. As a result, participation across groups was uneven. A small number of confident students tended to dominate discussions, while others hesitated to express their ideas. Analytical questioning also proved challenging; most students formulated questions that focused on factual clarification rather than examining causes, relationships, or multiple perspectives within social issues. At the same time, the teacher was still adjusting to the new instructional role as a facilitator of inquiry rather than as the primary source of knowledge, highlighting the need for clearer scaffolding and structured guidance during the learning process.

Interview data with the teacher further illustrated the challenges encountered during Cycle 1. The teacher acknowledged that both the teacher and students were still adapting to the inquiry-based approach. As expressed in the interview, "*At the beginning, students were not used to asking questions or discussing ideas in groups. They usually waited for the teacher's explanation before responding*" (Kilpatrick, Personal communication, September 2024). The teacher also noted that facilitating inquiry required different classroom management strategies compared to conventional teaching methods. Another interview excerpt stated, "*I realized that I needed to guide students more clearly on how to ask questions and investigate a topic, because they were not yet familiar with this process*" (Van de Walle, Personal communication, September 2024). These reflections indicate that the early stage of inquiry implementation required deliberate pedagogical adjustments and explicit guidance to help students develop inquiry skills and confidence in collaborative discussion.

In response to these challenges, pedagogical refinements were introduced in Cycle 2 to strengthen the structure of the inquiry process. The teacher provided more explicit scaffolding for each stage of inquiry, including modeling how to formulate analytical questions, guiding students in collecting and organizing information, facilitating collaborative analysis, and encouraging reflective synthesis. Group activities were redesigned with clearer role distribution so that each student had a specific responsibility during the investigation process. Formative feedback was also provided more systematically, enabling students to refine their ideas and improve their reasoning. These adjustments produced more balanced classroom interaction and increased students' confidence in sharing their perspectives. By Cycle 3, inquiry routines had become more embedded in classroom culture. Students began generating their own investigative questions, engaging actively in peer dialogue, and synthesizing ideas across disciplinary perspectives. Classroom discussions demonstrated deeper conceptual understanding and stronger analytical reasoning, indicating that students had begun to take greater ownership of their learning within the inquiry-based transdisciplinary framework.

**Improvement in Teacher and Student Activities**

**Quantitative Trends Across Cycles**

Observation data reveal a consistent and progressive improvement in the quality of teacher and student activities throughout the three research cycles. These observations focused on several key indicators, including the level of student participation, the nature of classroom interaction, the effectiveness of teacher facilitation, and the degree to which inquiry processes

were implemented during learning activities. As the inquiry-based and transdisciplinary instructional approach was gradually integrated into classroom practice, both teachers and students showed increasing familiarity with their respective roles in the learning process. Teachers became more confident in facilitating inquiry and guiding discussions, while students demonstrated greater initiative in questioning, investigating, and collaborating with peers. The overall trend of improvement in classroom engagement and instructional quality is summarized in Table 1.

Table 1. Improvement in Teacher and Student Activities

| Cycle | Average Score (%) | Interpretation |
|---|---|---|
| 1 | 70.45 | Fair |
| 2 | 78.41 | Good |
| 3 | 86.36 | Very Good |

The data presented in Table 1 illustrate a clear upward trajectory in the quality of classroom interaction and engagement. In Cycle 1, the activity level was categorized as *fair*, reflecting the early stage of adaptation to inquiry-oriented learning, where both teachers and students were still adjusting to new instructional expectations. By Cycle 2, the improvement to the *good* category suggests that pedagogical adjustments, such as clearer scaffolding of inquiry steps and more structured collaborative tasks, began to positively influence classroom participation. In Cycle 3, the activity score reached the *very good* category, indicating that inquiry practices had become more fully internalized within the classroom environment. This steady progression demonstrates that the successful implementation of inquiry-based and transdisciplinary learning requires iterative refinement and sustained practice before reaching optimal effectiveness in promoting active, participatory learning.

**Qualitative Changes in Classroom Interaction**

Qualitative classroom observations revealed a notable transformation in learning dynamics following the implementation of inquiry-based and transdisciplinary learning approaches. In the initial stages of the intervention, classroom interaction was still dominated by teacher-directed questioning that primarily required students to recall factual information, such as identifying definitions or repeating explanations from the textbook. Questions posed during lessons were typically closed-ended and aimed at confirming whether students remembered key terms, for example, "*What is social interaction*?" or "*What are the characteristics of community life*?" However, as the inquiry process progressed through successive cycles, the nature of classroom questioning gradually evolved. Students began to ask more analytical and exploratory questions that examined relationships, causes, and implications within social phenomena. For instance, learners began discussing how different community roles shape environmental responsibility or how human actions affect social harmony in their surroundings. This shift indicates a movement from surface-level engagement toward deeper cognitive processing, where students actively explored concepts rather than merely recalling information.

Interview data with the teacher further confirmed this transformation in classroom interaction. The teacher explained that students gradually became more confident in asking questions and expressing their ideas during inquiry activities. As the teacher stated in the interview, *"At first, students only answered questions from the teacher, but after several lessons they began asking their own questions about the topic we were discussing"* (Morrow, Personal communication, October 2024). The teacher also observed that group investigations encouraged students who were previously passive to participate more actively. According to another interview excerpt, *"When students worked in groups, they started discussing and sharing opinions with their friends. Even the quieter students tried to contribute because they had a role in the group activity"* (Fisher & Frey, Personal communication, July 2024). These statements illustrate that collaborative inquiry activities

helped create a learning environment in which participation was more evenly distributed and students felt encouraged to engage in the learning process.

Alongside these changes in student participation, reflective dialogue became increasingly prominent as part of classroom discourse. Students demonstrated a growing ability to connect conceptual discussions with everyday experiences within the boarding school environment, particularly when exploring topics related to social responsibility and environmental sustainability. Instead of viewing classroom knowledge as abstract information, learners began interpreting concepts through the lens of their lived experiences. The teacher also reported a shift in instructional role from information provider to facilitator of inquiry. As expressed during the interview, *"My role changed from explaining the material to guiding students' discussions and helping them think more deeply about the issues"* (Hott, Personal communication, November 2024). Through probing questions, structured guidance, and encouragement of peer feedback, the teacher facilitated a more dialogical learning environment. As a result, classroom interaction became more participatory, reflective, and intellectually engaging, demonstrating the core characteristics of inquiry-based and transdisciplinary learning.

## Student Learning Outcomes and Higher-Order Thinking Development

### Achievement Score Progression

Formative assessment results indicate a steady and meaningful improvement in students' learning outcomes across the three action research cycles. These assessments were designed not only to measure factual understanding but also to evaluate students' ability to analyze social phenomena, interpret contextual information, and apply concepts in problem-solving situations. As inquiry-based and transdisciplinary learning activities were progressively implemented, students demonstrated increasing competence in articulating ideas, connecting theoretical knowledge with real-life contexts, and reasoning through social issues. The development of these competencies is reflected in the gradual increase in average scores across cycles, as presented in Table 2.

Table 2. Student Learning Outcomes and Higher-Order Thinking Development

| Cycle | Average Score | Improvement (%) |
|---|---|---|
| 1 | 67.95 | – |
| 2 | 75.45 | +11.03 |
| 3 | 82.27 | +20.99 |

The data presented in Table 2 illustrate a clear upward trend in students' academic performance throughout the intervention. The average score in Cycle 1 represents the baseline condition, where many students were still adjusting to the demands of inquiry-oriented learning. The notable increase in Cycle 2 suggests that improvements in instructional scaffolding, clearer inquiry stages, and more structured collaborative activities helped students engage more actively with the learning process. By Cycle 3, students demonstrated stronger conceptual understanding and improved analytical reasoning, reflected in the highest average score achieved during the study. This pattern indicates that the sustained implementation of structured inquiry and transdisciplinary learning not only strengthened students' mastery of Social Studies concepts but also supported the development of higher-order thinking skills, such as analysis, interpretation, and contextual application.

### Evidence of Higher-Order Thinking

Student responses in Cycle 3 reflected a marked shift toward analytical and higher-order reasoning. Unlike earlier stages where explanations were largely descriptive, students began articulating clear cause-and-effect relationships between human activities, such as excessive

waste production, lack of recycling practices, or irresponsible consumption, and observable environmental degradation within their community. They were able to trace chains of impact, explaining how individual behavior contributes to collective consequences. Moreover, students demonstrated the ability to compare differing community perspectives, recognizing that environmental issues are shaped by social attitudes, economic considerations, and cultural habits. Rather than offering simplistic answers, they proposed solutions grounded in shared responsibility, emphasizing cooperation, awareness-building, and sustainable habits. This progression signaled not only conceptual understanding but also evaluative judgment and problem-solving capacity.

Importantly, students increasingly bridged classroom discourse with real-life practices within the boarding school environment. Discussions about sustainability were linked to concrete issues such as dormitory waste management systems, water usage discipline, and patterns of communal cooperation. This contextualization deepened ownership of learning, as students saw themselves as active participants rather than detached observers. Integration across disciplines became clearly visible: scientific explanations regarding environmental impact were combined with civic reasoning about collective action and ethical reflections rooted in moral accountability. Students moved beyond memorizing definitions toward synthesizing knowledge from multiple domains to construct coherent, context-sensitive arguments. These outcomes indicate a significant developmental shift, from surface learning to critical, integrative thinking that connects knowledge, values, and action.

**Transdisciplinary and Contextual Learning Impact**

The transdisciplinary framework created space for authentic and contextualized problem exploration, moving learning beyond textbook-based abstraction. Rather than merely discussing environmental sustainability in theoretical terms, students examined concrete issues within their immediate community, such as waste management practices, water usage habits, and patterns of social interaction affecting environmental cleanliness. They conducted simple field observations, gathered qualitative data through interviews or documentation, and collaboratively analyzed their findings. This process enabled them to connect conceptual knowledge with lived realities. As students identified tangible problems and proposed actionable solutions, such as awareness campaigns, waste sorting initiatives, or community-based clean-up programs, learning became purposeful and experience-driven. The relevance of the content increased motivation, as students recognized that their inquiry had practical implications for their surroundings. The framework thus transformed learning into a meaningful engagement with real-world complexity rather than an abstract academic exercise.

Within the Islamic educational context, this inquiry-based transdisciplinary model demonstrated strong philosophical alignment with core Islamic values. The emphasis on reflective thinking resonates with the principle of *tafakkur*, which encourages critical contemplation of social and natural phenomena as signs of divine wisdom. The focus on responsibility reflects the concept of *amanah*, positioning humans as entrusted stewards accountable for their actions toward society and the environment. Furthermore, the orientation toward sustainable solutions embodies the pursuit of *maslahah* (collective welfare), a foundational objective in Islamic ethical reasoning. Importantly, the outcomes of this approach extended beyond improved cognitive performance. Students developed ethical sensitivity, collaborative skills, and a heightened sense of social accountability. This holistic integration of intellectual inquiry, moral reflection, and communal responsibility illustrates the compatibility between IB-PYP inquiry principles and Islamic educational philosophy, affirming that transdisciplinary learning can serve as both an academic and character-forming endeavor within Islamic schooling contexts.

The findings of this study indicate that the integration of structured inquiry within the IB-PYP transdisciplinary framework contributed to meaningful improvements in classroom interaction, student engagement, and learning outcomes in Social Studies education. These outcomes can be interpreted through an integrated constructivist framework that views learning as an active process of meaning-making through inquiry, social interaction, and reflection rather than passive reception of information (Piaget, 1972; Vygotsky, 1978; Fosnot, 2020; Hmelo-Silver & Jeong, 2021). Within this perspective, inquiry-based learning functions as the pedagogical mechanism through which students formulate questions, investigate problems, and collaboratively build understanding, while the IB-PYP framework provides the curricular structure that connects concepts across disciplines through central ideas and authentic contexts (Drake & Reid, 2020; Gürkan, 2021).

The progressive improvement observed across the three research cycles suggests that pedagogical transformation toward inquiry-oriented learning develops gradually through sustained practice, reflection, and instructional adjustment. Initial classroom conditions were still characterized by teacher-centered interaction and factual recall, reflecting concerns raised in prior studies that Social Studies learning often remains dominated by memorization rather than conceptual understanding (Oktaviana, 2025; Wijesekera & Hameed, 2026; Zou et al., 2026). Similar critiques appear in global education discourse, where schools are increasingly expected to cultivate critical thinking, creativity, and collaborative problem solving rather than mere content coverage (Chen et al., 2026; OECD, 2021; Swanzy-Impraim, 2026; Tuero-O'Donnell et al., 2026). The findings of this study, therefore, align with broader international efforts to transform classroom learning into more participatory and intellectually engaging experiences.

The challenges encountered in Cycle 1 also illustrate the complexity of implementing inquiry pedagogy in classrooms accustomed to conventional teaching practices. Students initially struggled to generate analytical questions, engage in sustained dialogue, and take responsibility for collaborative tasks. This pattern is consistent with Kirschner and Hendrick's (2020) argument that students require cognitive adjustment when transitioning from passive learning to active knowledge construction. However, the steady improvement in participation and reasoning across subsequent cycles indicates that structured scaffolding can effectively support this transition. Studies on inquiry pedagogy emphasize that guided questioning, staged investigation, and reflective feedback are essential for developing reasoning skills and learner confidence (Bell et al., 2021; Ghahari et al., 2026; Negerie et al., 2026; Zhang et al., 2026).

The findings further reinforce substantial empirical evidence that inquiry-based learning enhances student engagement and academic achievement. Meta-analytic research has shown that discovery-oriented instruction improves conceptual understanding and problem-solving when accompanied by appropriate guidance (Alfieri et al., 2020). In Social Studies contexts, inquiry learning has been associated with stronger analytical reasoning, critical thinking, and the ability to interpret social issues through multiple perspectives (Aashamar & Mathé, 2025; Seprie et al., 2025; Wutsqo et al., 2025). In the present study, improvements in participation and students' ability to explain cause and effect relationships within environmental and social issues indicate that inquiry tasks successfully stimulated deeper cognitive engagement and sustained learning involvement (Xie, 2026; Pritam & Kirti, 2026).

The transdisciplinary dimension of the IB-PYP framework played an equally important role in strengthening the coherence and relevance of learning. Transdisciplinary curriculum models seek to integrate knowledge from multiple disciplines in order to address authentic, real-world issues that cannot be understood through a single subject lens (Drake & Reid, 2020; Gürkan, 2021). Within the IB-PYP model, according to its organization in 2018, learning is organized around central ideas and conceptual questions that encourage students to investigate themes from diverse disciplinary perspectives. This orientation is increasingly supported by

contemporary research emphasizing interdisciplinary and transdisciplinary learning as essential for responding to global complexity (Atkinson-Toal, 2026; Yang et al., 2026). By connecting Social Studies concepts with environmental science, language learning, and ethical reflection, the present study enabled students to develop more holistic understandings of sustainability and social responsibility (Swanzy-Impraim, 2026).

Another important outcome of the intervention was the development of higher-order thinking skills. Students gradually progressed from descriptive answers toward analytical explanations involving causes, consequences, comparisons, and possible solutions (Tabiri, 2026). Such development supports the constructivist proposition that learning deepens when students actively engage in interpreting and reorganizing knowledge (Fosnot, 2020). Opportunities for peer dialogue, group problem solving, and reflective discussion encouraged students to test assumptions and refine arguments collaboratively. Similar patterns have been identified in previous studies showing that inquiry and cooperative problem-solving approaches enhance conceptual understanding, critical reasoning, and transfer of learning (Bell et al., 2021; Kumazah & Agyei, 2026; Wakjira et al., 2026; Wang & Qi, 2026).

Teacher professional growth also emerged as a significant result of the intervention. Across the cycles, the teacher gradually shifted from functioning as a transmitter of information to acting as a facilitator who guided exploration through probing questions, structured tasks, and reflective dialogue. Previous studies on IB-PYP implementation emphasize that teacher roles are central to creating inquiry-oriented environments and supporting student agency (Aksoy & Bozdoğan, 2024; Gürkan, 2021). The present findings further suggest that pedagogical adaptability and reflective teaching practices are critical for the successful implementation of innovative curriculum models, particularly in changing institutional contexts (Rachman et al., 2024).

The successful contextual adaptation of inquiry-based transdisciplinary learning within an Islamic boarding school setting also demonstrates the flexibility of the model. Contemporary educational reform increasingly recognizes that innovation should promote not only cognitive competence but also ethical awareness and social responsibility (Chen et al., 2026; Vargas-Merino & Vivanco Aquino, 2026). In this study, the integration of sustainability themes with Islamic values such as stewardship, responsibility, and collective welfare helped situate inquiry activities within students' lived cultural and religious experiences. This finding is consistent with literature emphasizing culturally responsive and value-based educational environments that connect academic learning with identity and moral development (Puspita Dewi et al., 2026; Siregar et al., 2025; Yan et al., 2026).

Finally, the findings contribute to broader discussions about preparing learners for the demands of an increasingly complex global society. Educational systems now emphasize competencies such as critical thinking, collaboration, systems thinking, and problem solving as essential for navigating social, technological, and environmental challenges (Geng, 2026; OECD, 2021; Sun et al., 2026). Inquiry-based transdisciplinary learning offers a powerful pedagogical pathway for developing these competencies because it encourages students to explore authentic issues through investigation, dialogue, reflection, and ethical reasoning. Overall, this study confirms that embedding structured inquiry within a coherent transdisciplinary curriculum framework can significantly strengthen Social Studies learning while simultaneously preparing students to become reflective, capable, and socially responsible citizens.

## CONCLUSION

This study concludes that the integration of inquiry-based learning within the IB-PYP transdisciplinary framework enhances the quality of Social Studies learning in an Islamic boarding school context. The iterative action research process demonstrates that sustained implementation fosters meaningful improvements in teacher facilitation practices, student engagement, and higher-order thinking development. Beyond academic achievement, the findings indicate a pedagogical transformation characterized by active questioning, collaborative investigation, reflective dialogue, and conceptual integration across disciplines. The alignment between inquiry pedagogy and Islamic educational values, such as reflection (*tafakkur*), responsibility (*amanah*), and collective welfare (*maslahah*), highlights the contextual adaptability of transdisciplinary approaches within faith-based institutions. Overall, the study affirms that embedding structured inquiry within a coherent curricular framework promotes holistic learning and positions Social Studies as a strategic medium for cultivating critical, reflective, and socially responsible learners in contemporary Islamic education. These findings contribute to the growing body of scholarship on inquiry-based pedagogy in Islamic education and demonstrate the potential of transdisciplinary curriculum frameworks to support meaningful and contextually relevant learning.

## BIBLIOGRAPHY

Aashamar, P. N., & Mathé, N. E. H. (2025). Inquiry in social studies and social science: Linking teachers' perspectives and classroom practice. *Nordic Journal of Comparative and International Education (NJCIE), 9*(4). https://doi.org/10.7577/njcie.6284

Aksoy, E., & Bozdoğan, D. (2024). IB-PYP curriculum and teachers' roles within IB-PYP. *Journal of Curriculum Studies, 56*(3), 355–370. https://doi.org/10.1080/00220272.2024.2322516

Alfieri, L., Brooks, P. J., Aldrich, N. J., & Tenenbaum, H. R. (2020). Does discovery-based instruction enhance learning? A meta-analysis. *Journal of Educational Psychology, 112*(1), 1–25. https://doi.org/10.1037/edu0000335

Atkinson-Toal, A. (2026). Student value of a transdisciplinary approach to curriculum development. *Journal of Marketing Education, 48*(1), 75–91. https://doi.org/10.1177/02734753241288182

Bell, S., Urhahne, D., Schanze, S., & Ploetzner, R. (2021). Collaborative inquiry learning: Models, tools, and challenges. *International Journal of Science Education, 43*(4), 1–20. https://doi.org/10.1080/09500693.2021.1877246

Chen, Z., Qin, S., Han, H., et al. (2026). Teaching innovation mechanism of higher education driven by AI fusion data. Discover Computing, 29, 160. https://doi.org/10.1007/s10791-026-10036-w

Drake, S. M., &Reid, J. L. (2020). Integrated curriculum as an effective way to teach 21st century capabilities. *Asia Pacific Journal of Educational Research, 3*(1), 31–50. https://doi.org/10.30777/APJER.2018.1.1.03

Fosnot, C. T. (2020). *Constructivism: Theory, perspectives, and practice (3rd ed.*). New York: Teachers College Press.

Geng, J. (2026). High-skilled STEM immigration in the United States: Global perspectives on policy, controversy, and sustainable development. *Humanities and Social Sciences Communications, 13*(1), Article 1. https://doi.org/10.1057/s41599-025-06346-x

Ghahari, S., Sedaghat, M., Forawi, S., & Ebrahimi, F. (2026). Inquiry-based learning in CBLI classrooms: Insights from higher education students in open and guided conditions. *International Journal of Applied Linguistics, 36*(1), 608–621. https://doi.org/10.1111/ijal.12787

Gürkan, B. (2021). Transdisciplinary integrated curriculum: An analysis of teacher experiences through a design model within the framework of IB-PYP. *Participatory Educational Research, 8*(1), 176–199. Retrieved from https://eric.ed.gov/?id=EJ1277155

Hmelo-Silver, C. E., & Jeong, H. (2021). Learning through problem solving and inquiry. In R. K. Sawyer (Ed.), *The Cambridge handbook of the learning sciences* (3rd ed., pp. 423–439). Cambridge University Press. https://doi.org/10.1017/9781108888295

Jannah, M., Oviana, W., Hayati, Z., Hidayat, R., Usman, J., & Noris, M. (2025). Enhancing Pre-Service Teachers' Science Process Skills Through Open-Ended and Guided Inquiry-Based Learning. *Jurnal Ilmiah Peuradeun*, *13*(2), 1235-1262. https://doi.org/10.26811/peuradeun.v13i2.1174

Kirschner, P. A., & Hendrick, C. (2020). *How learning happens: Seminal works in educational psychology and what they mean in practice*. Oxfordshire: Routledge.

Kumazah, V., & Agyei, D. D. (2026). From classroom to long-term results: The impact of inquiry-based teaching on student achievement and retention in geometry. *International Journal of Science and Mathematics Education, 24*(14), Article 14. https://doi.org/10.1007/s10763-025-10640-0

Negerie, D., Habtamu, T., & Tafesse, T. (2026). Effect of guided inquiry with the 5E model on students' engagement in biology at secondary schools in Mattu town, Southwest Ethiopia. *Discover Education, 5*, 203. https://doi.org/10.1007/s44217-026-01249-8

OECD. (2021). *21st-century readers: Developing literacy skills in a digital world*. OECD Publishing. https://doi.org/10.1787/a83d84cb-en

Oktaviana, R. (2025). Rethinking social studies pedagogy: From memorization to conceptual understanding in Indonesian primary schools. *International Journal of Instruction, 18*(1), 255–270. https://doi.org/10.29333/iji.2025.18115a

Olbytri, F., Nenotek, S. A., Regina Caeli, R., & Agustina Amelia, N. (2025). Personal inquiry and student agency in the International Baccalaureate Primary Years Programme. *International Journal of Educational Research, 121*, 102192. https://doi.org/10.1016/j.ijer.2024.102192

Piaget, J. (1972). *The psychology of the child*. New York: Basic Books.

Pritam, B. P., & Kirti, J. (2026). Examining the relationship between financial assistance schemes and women empowerment: A study of doctoral research in Indian higher education. *Discover Education, 5*, 28. https://doi.org/10.1007/s44217-025-00986-6

Puspita Dewi, E. M., Razak, A., & Tetteng, B. (2026). Virtual solutions for diversity: The emerging role of assistive technology in inclusive higher education. *Quality Education for All, 3*(1), 53–70. https://doi.org/10.1108/QEA-07-2025-0069

Rachman, A., Sunarno, S., Saputra, N., Judijanto, L., Nurhidin, E., & Zamroni, M. A. (2024). Enhancing Teacher Performance Through Millennial Teacher Characteristics, Work Culture, and Person-Job Fit Mediated by Employee Engagement. *Nazhruna: Jurnal Pendidikan Islam*, *7*(2), 270-289. https://doi.org/10.31538/nzh.v7i2.4636

Seprie, W., Wuryandani, W., & Muthmainah. (2025). Transforming primary education: Balancing social skills and academic achievement through global inquiry-based learning models. *Frontiers in Education, 10*, 1512274. https://doi.org/10.3389/feduc.2025.1512274

Siregar, H. S., Rizza, M., & Nurhamzah, N. (2025). Islamic Education in the Digital Age: Students' Perspectives on the Vark Model in the Context of Education 4.0. *Ulumuna*, *29*(1), 129-154. https://doi.org/10.20414/ujis.v29i1.1319

Sun, X., Ren, W., Liu, L., Xu, J., Gao, M., & Li, M. (2026). The impact of computational modeling on students' systems thinking in science education: A meta-analysis in K-16. *Journal of Research in Science Teaching, 63*(2), 107–123. https://doi.org/10.1002/tea.70028

Swanzy-Impraim, E. (2026). Creativity development in art education: A proposed framework. *Discover Education, 5*, 273. https://doi.org/10.1007/s44217-026-01296-1

Tabiri, F. (2026). The weight of lecturers' pedagogical practices in developing higher and lower-order thinking skills in higher education. *Discover Education, 5*, 200. https://doi.org/10.1007/s44217-026-01118-4

Tuero-O'Donnell, J. D., Castrejón, G., & Olivo, P. G. (2026). Impact of a philosophical didactic approach on the development of critical thinking: Qualitative evidence from the teaching of quantum physics. *Journal of New Approaches in Educational Research, 15*, 10. https://doi.org/10.1007/s44322-026-00059-y

Vargas-Merino, J. A., & Vivanco Aquino, I. D. B. (2026). Social innovation and sustainability competencies: Multivariate evidence using PLS-SEM in the context of higher education. *Social Sciences & Humanities Open, 13*, 102759. https://doi.org/10.1016/j.ssaho.2026.102759

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge: Harvard University Press.

Wakjira, G. T., Ayele, M. A., & Birhanu, Z. K. (2026). Effect of the integrated cooperative problem solving and multiple representations approach on mathematical problem solving skills. *Discover Education, 5*, 195. https://doi.org/10.1007/s44217-026-01353-9

Wang, R., & Qi, C. (2026). To what extent do mathematics textbooks offer opportunities for student reflection? A case study of two Chinese textbooks. *Eurasia Journal of Mathematics, Science and Technology Education, 22*(4), em2819. https://doi.org/10.29333/ejmste/18296

Wijesekera, H. D., & Hameed, R. (2026). From rote learning to critical inquiry: Fostering higher order thinking skills through collaborative questioning in a rural secondary English-medium science classroom. *Thinking Skills and Creativity, 60*, 102093. https://doi.org/10.1016/j.tsc.2025.102093

Wutsqo, F., Rahman, A., Sari, D. P., & Lestari, Y. (2025). Inquiry learning and student engagement in elementary social studies classrooms. *Journal of Curriculum and Teaching, 14*(1), 34–48. https://doi.org/10.5430/jct.v14n1p34

Xie, H. (2026). Sequential decision-making in online learning engagement among Chinese EFL learners: A reinforcement learning approach. *Smart Learning Environments, 13*, 21. https://doi.org/10.1186/s40561-026-00445-1

Yan, Q., Alharbi, M. H., Deebani, W., & Liu, Y. (2026). Educating for rehabilitation literacy in physical activity: A qualitative study of medical and non-medical students' experiences in a Chinese university. *European Journal of Education, 61*(1), Article e70425. https://doi.org/10.1111/ejed.70425

Yang, S. C., Hsueh, Y. H., & Hung, S. C. (2026). Interdisciplinary strategies in STE(A)M education: A critical analysis of curriculum and pedagogy. *Research in Science & Technological Education*, 1–32. https://doi.org/10.1080/02635143.2026.2628601

Zhang, L., Wang, X., Chen, W., et al. (2026). Using multimodal learning analytics to understand the combined effects of dynamic self-regulated scaffoldings and learning from examples on computer programming: An empirical study. *International Journal of STEM Education, 13*, 3. https://doi.org/10.1186/s40594-025-00591-x

Zou, Y., Chen, R., Xue, X., et al. (2026). Assessment of conceptual understanding in student learning about liquefaction. *Research in Science Education*. Advance online publication. https://doi.org/10.1007/s11165-026-10321-0