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Ulul Albab–Based Lesson Study in Madrasah Aliyah: A School Action Research on Science and Mathematics Teachers' Pedagogical Transformation

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Abstract

The integration of Islamic values into science and mathematics instruction in madrasahs remains a persistent challenge in Classroom practice. While prior studies on Lesson Study have demonstrated improvements in instructional quality and collaborative reflection, limited attention has been given to how such professional learning structures can support the enactment of value-based pedagogies. This study addresses that gap by examining a modified Lesson Study model grounded in the Ulul Albab framework within a school-based action research design conducted over two cycles at a Madrasah Aliyah in Indonesia. Data were collected through participatory observation, in-depth interviews, and lesson plan analysis. The findings indicate that the model contributed to measurable shifts in teachers' pedagogical practices, particularly in the design of inquiry-based lessons that integrated reflective and ethical dimensions alongside scientific reasoning. However, the integration process was not uniform; some teachers initially reverted to symbolic or add-on approaches before gradually developing more coherent alignment between content and values. Compared to conventional Lesson Study implementations, the Ulul Albab-based model explicitly structures reflective dialogue around the epistemic and ethical dimensions of the subject matter, thereby extending the scope of collaborative inquiry beyond pedagogical techniques. These findings suggest that Lesson Study can function not only as a mechanism for improving instructional strategies but also as a structured space for negotiating the pedagogical meaning of value integration. The study contributes an empirically grounded professional development model that demonstrates both the possibilities and the practical challenges of translating faith-science integration into Classroom practice.

Keywords: Integration of Islamic values, Ulul Albab-based Lesson Study, Value-based pedagogy, Science and mathematics instruction, Teacher professional development.

Abstrak

Integrasi nilai-nilai Islam ke dalam pembelajaran sains dan matematika di madrasah masih menjadi tantangan yang terus-menerus dalam praktik pembelajaran di kelas. Meskipun penelitian sebelumnya mengenai Lesson Study telah menunjukkan peningkatan dalam kualitas pengajaran dan refleksi kolaboratif, perhatian yang diberikan terhadap bagaimana struktur pembelajaran profesional semacam itu dapat mendukung penerapan pedagogi berbasis nilai masih terbatas. Penelitian ini mengatasi kesenjangan tersebut dengan mengkaji model Lesson Study yang dimodifikasi berdasarkan kerangka

kerja Ulul Albab dalam desain penelitian tindakan berbasis sekolah yang dilaksanakan selama dua siklus di sebuah Madrasah Aliyah di Indonesia. Data dikumpulkan melalui observasi partisipatif, wawancara mendalam, dan analisis rencana pelajaran. Temuan menunjukkan bahwa model tersebut berkontribusi pada perubahan yang terukur dalam praktik pedagogis guru, terutama dalam perancangan pelajaran berbasis penyelidikan yang mengintegrasikan dimensi reflektif dan etis bersama dengan penalaran ilmiah. Namun, proses integrasi tersebut tidak merata; beberapa guru awalnya kembali ke pendekatan simbolis atau tambahan sebelum secara bertahap mengembangkan keselarasan yang lebih koheren antara konten dan nilai. Dibandingkan dengan implementasi Lesson Study konvensional, model berbasis Ulul Albab secara eksplisit mengstrukturkan dialog reflektif seputar dimensi epistemik dan etis dari materi pelajaran, sehingga memperluas cakupan penyelidikan kolaboratif melampaui teknik pedagogis. Temuan ini menunjukkan bahwa Lesson Study dapat berfungsi tidak hanya sebagai mekanisme untuk meningkatkan strategi pengajaran, tetapi juga sebagai ruang terstruktur untuk menegosiasikan makna pedagogis dari integrasi nilai. Studi ini menyumbangkan model pengembangan profesional yang didasarkan pada bukti empiris yang menunjukkan baik kemungkinan maupun tantangan praktis dalam menerjemahkan integrasi iman-ilmu ke dalam praktik di kelas.

Keywords: *Integrasi nilai Islam, Lesson Study berbasis Ulul Albab, Pedagogi berbasis nilai Pembelajaran sains dan matematika, Pengembangan profesional guru.*

INTRODUCTION

Contemporary Islamic education is faced with the fundamental challenge of bridging the dichotomy between religious sciences and general sciences, such as science and mathematics (Fauzi et al., 2025; Masturin, 2022; Putri et al., 2025). In many Islamic educational institutions, including madrasas, the integration of Islamic values into general subjects is often superficial or artificial (Adiyono et al., 2025; Aryasutha et al., 2025; Asrori et al., 2025; Fahrudin & Wardhani, 2025). A common practice is the thematic insertion of Quranic verses or hadith without in-depth pedagogical elaboration, thus failing to connect Islamic ethical and spiritual principles with the conceptual framework of modern science (Alzahrani, 2022). As a result, science and mathematics instruction in madrasas risks losing its spiritual relevance, while religious education appears isolated from empirical reality and scientific progress (Astutik et al., 2024; Martanti et al., 2026; Siregar et al., 2025). Failure in this synthesis not only weakens the Islamic identity of educational institutions, but also hinders the development of critical and holistic thinking competencies in students.

Amid these challenges, the pedagogical competence of general subject teachers becomes a decisive factor in determining whether value integration moves beyond symbolic insertion (Arizona et al., 2025; Hakim et al., 2025). Several studies indicate that teachers with backgrounds in science or mathematics education often experience difficulty in translating Islamic values into concrete instructional strategies (Nugroho et al., 2022; Pradana et al., 2025). The challenge does not merely lie in understanding religious concepts, but in operationalizing them into coherent pedagogical components such as aligning learning objectives, selecting inquiry tasks, and designing assessments that reflect both scientific rigor and ethical reflection (M. B. Aziz & Amir, 2025; Perdana et al., 2025).

This difficulty is compounded by the limited availability of Continuing Professional Development (CPD) models tailored to the madrasah context. Existing CPD and Emotional Intelligence (EQ)-based programs tend to emphasize generic pedagogical improvement,

classroom management, or affective sensitivity, without providing structured guidance on how teachers can systematically integrate epistemic and spiritual dimensions within subject-specific lesson design (Kjeldsen, 2023). As a result, professional development initiatives often improve teaching techniques but leave unresolved the practical question of how faith-science integration can be enacted in daily classroom practice (Bahruddin et al., 2026; Dharin et al., 2026; Sabariah et al., 2025).

These conceptual and practical limitations reveal a specific gap: teachers lack a collaborative, practice-oriented framework that bridges value discourse with instructional design. It is precisely this gap that the present study seeks to address through the development and testing of an Ulul Albab-based Lesson Study model.

Herein lies the content problem and research gap that is the focus of this study. Practically speaking, the problem is a pedagogical failure: general subject teachers lack concrete methods for integrating values, so their practice is limited to superficial, non-transformative recitation of verses (Ajid et al., 2025; Jannati et al., 2025). This creates a fragmented learning experience for students (Shah & Alqatawna, 2025). Academically (research gap), the literature review reveals two major limitations. First, studies on the integration of Islam and science are often highly theoretical and philosophical, failing to offer intervention models that can be implemented and tested in the classroom (Schnepfleitner & Ferreira, 2021; Sims & CUNLIFF, 2022). Second, although research on Lesson Study is abundant and has been proven effective for technical improvements in teaching, its implementation as a vehicle for internalizing spiritual values and transforming teachers' professional identity in the context of religious education is still very rarely explored (Marhayani et al., 2022; Mario et al., 2023). There is a gap in research that systematically bridges the gap between value integration theory and collaborative teacher professional development practices in the field.

A number of studies have demonstrated the effectiveness of Lesson Study in enhancing teaching practices across disciplines, particularly in improving instructional quality and collaborative pedagogical reflection (Fox & Poultney, 2020). However, most of these studies primarily emphasize cognitive learning outcomes and general pedagogical competencies rather than the integration of value-based or spiritual dimensions of learning.

In parallel, research on the integration of Islamic values in science and mathematics education has grown in recent years. Nevertheless, these studies largely remain at the conceptual or philosophical level, proposing frameworks or models of Islam-science integration without systematically examining their implementation through structured teacher professional development processes (Amzat, 2022; Amzat et al., 2022). Empirical investigations that operationalize such integration into collaborative instructional practices are still limited.

Consequently, there is a lack of research that connects the theoretical discourse of Islam-science integration with practical, school-based professional learning mechanisms. Specifically, prior studies have not explored how Lesson Study may function as a structured intervention to support teachers in collaboratively internalizing and implementing spiritual value frameworks such as the *Ulul Albab* perspective within the teaching of general subjects in religious school settings.

Addressing this gap is important because the successful integration of spiritual values into classroom practice depends not only on conceptual models but also on sustainable professional learning structures for teachers. Therefore, this study empirically examines Lesson Study as a collaborative intervention model to facilitate the integration of Ulul Albab values into instructional practice, thereby bridging the divide between theoretical integration and classroom implementation.

The purpose of this paper is to address the practical shortcomings of existing science religion integration models in Islamic education, which largely remain at a macro-philosophical level and lack clear pedagogical application in classroom settings. While previous models such as the Globe, Spider Web, Tree of Knowledge, and Twin Towers offer strong conceptual foundations, they do not sufficiently guide teachers in translating these ideas into daily instructional practices. Therefore, this study aims to develop and implement a micro-pedagogical model by adapting Lesson Study through the integration of the Ulul Albab framework. The novelty of this paper lies in its focus on bridging the gap between philosophical discourse and classroom practice by providing a structured, collaborative, and practice-oriented approach that enables teachers to operationalize the integration of scientific knowledge and spiritual values within real teaching contexts.

This paper tests the argument that the integration of the Ulul Albab framework within a Lesson Study cycle can effectively enhance teachers' pedagogical competence by facilitating the internalization and practical implementation of spiritually grounded teaching values. Specifically, it hypothesizes that collaborative processes of planning, observing, and reflecting (Plan-Do-See) serve as an effective mechanism for helping teachers move beyond superficial or additive approaches to integration, toward a more coherent and meaningful synthesis of dhikr (spiritual awareness) and *fikr* (intellectual reasoning) in science and mathematics instruction.

METHOD

This research employed a School Action Research (SAR) design. This design was chosen because its goal was not only to understand phenomena but also to implement planned interventions to directly improve teacher professional practice and the quality of learning within the school environment. This approach is participatory and collaborative, with researchers working with teachers as partners in identifying problems, designing solutions, implementing actions, and reflecting on the results (Chaudhary et al., 2024). The research was conducted in two interconnected cycles. Each cycle consisted of four main stages: planning, acting, observing, and reflecting. This cyclical model allowed for iterative improvement and adjustment of interventions based on findings from the previous cycle, ensuring the relevance and effectiveness of the developed model (Abdussamad, 2021).

This research was conducted at a private Islamic Senior High School (Madrasah Aliyah) in Indonesia that is committed to strengthening the integration of Islamic values into its curriculum. Participants were selected using purposive sampling to ensure the relevance and depth of the data. The primary participants were four general subject teachers, consisting of two Mathematics teachers and two Science teachers (Physics and Biology), with teaching experience ranging from three to ten years. The selection criteria included a willingness to

actively participate in all Lesson Study activities and an openness to exploring reflective and integrative teaching approaches. In addition to the teachers, the principal was involved as a facilitator and observer in several sessions to provide institutional support.

The study was implemented through two Lesson Study cycles consisting of collaborative planning, classroom observation, and reflective discussion. The decision to employ two cycles was grounded in methodological considerations. In Lesson Study practice, iterative cycles are intended to allow teachers to move from initial exposure and conceptual understanding toward refinement and practical application. The first cycle functioned as an exploratory phase in which teachers experimented with integrating Ulul Albab principles into lesson design, while the second cycle enabled reflection-based improvement and consolidation of pedagogical practices. Within the scope of this study, two cycles were considered sufficient to capture observable changes in teaching approach and collaborative reflection, particularly given the focus on testing the feasibility and pedagogical impact of the Ulul Albab-based Lesson Study model rather than achieving long-term institutional transformation.

The main intervention in this research is the implementation of a modified Lesson Study model with the *Ulul Albab* value framework. The *Ulul Albab* framework is operationalized into concrete pedagogical principles, including: (1) Problem-based learning that encourages critical reasoning (fikr), (2) Integration of content with Islamic spiritual and ethical reflection (*dhikr*), and (3) Orientation towards social contribution and real-life problem-solving (*amal shaleh*). The research process in each cycle follows the following flow: first, the Planning Stage (Plan). The participating teachers and the researcher collaboratively design a Learning Implementation Plan (RPP) or research lesson. In this stage, they discuss how to integrate the *Ulul Albab* principles into learning objectives, core activities, prompting questions, and authentic assessment designs. Second, the Action and Observation Stage (Do & See). One teacher from the group implements the RPP in her actual classroom. Meanwhile, the other teacher and the researcher act as participant observers. The focus of observations is on student responses, the effectiveness of value integration strategies, and challenges that arise during the learning process. Observations are documented through field notes and video recordings. Third, the Reflection Stage. Immediately after the lesson is completed, the entire team (model teacher, observer teacher, and researcher) gathers for a post-lesson discussion. This session is guided by the findings from the observations to discuss the successes and weaknesses of the lesson and formulate recommendations for improvement in the lesson plan for the next cycle. The second cycle repeats the same process, but with a revised lesson plan based on the reflections from the first cycle, allowing for progressive improvement in the quality of the intervention.

This study was designed as a qualitative school-based action research to enable an in-depth examination of how Ulul Albab principles were enacted within classroom practice. Beyond procedural implementation, the intervention was analytically structured around three operational dimensions derived from the Ulul Albab framework: (1) *fikr* (critical-intellectual engagement), (2) *dhikr* (reflective-spiritual awareness), and (3) *amal shaleh* (ethical-action orientation). These dimensions functioned not merely as conceptual references but as analytical categories guiding observation, interview protocols, and document analysis.

During classroom observations, indicators of fikr included the extent to which teachers encouraged inquiry-based reasoning and conceptual connections between scientific phenomena and broader epistemic reflection. *Dhikr* was identified through moments of reflective dialogue linking subject matter to spiritual consciousness or moral awareness, while amal shaleh was operationalized as the alignment between lesson objectives, learning activities, and socially responsible or ethical applications of knowledge. The evolution of these elements was tracked through iterative comparison of Lesson Plan (RPP) documents across cycles.

Data were analyzed using thematic coding, with Ulul Albab dimensions serving as initial deductive codes, followed by inductive refinement to capture emergent pedagogical patterns. The triangulation of classroom observation, interview narratives, and lesson plan revisions ensured analytic consistency between intervention design and findings.

The researcher acted as a participant-observer within the Lesson Study process, facilitating reflection sessions while maintaining analytic distance through systematic field notes and peer debriefing. Reflexive memos were used to examine potential researcher bias, particularly given the normative appeal of value integration within the madrasah context. This alignment between intervention design, operational indicators, and analytic procedures strengthens the credibility of the study's claims regarding pedagogical transformation..

Data were collected through: first, Participant Observation. The researcher was directly involved in all Lesson Study sessions (planning, implementation, and reflection) and conducted classroom observations to record interaction dynamics, teacher pedagogical practices, and student engagement. Second, In-Depth Interviews. Semi-structured interviews were conducted with participating teachers before the first cycle (to understand initial challenges) and after the second cycle (to explore changes in their perceptions, understanding, and competencies in depth). Third, Document Analysis. The lesson plan documents produced in each cycle were analyzed to track the development of teachers' abilities in designing integrated learning. In addition, student work portfolios were also analyzed as evidence of learning impact.

The data analysis process in this study employed the interactive model of analysis proposed by Miles, Huberman, (Miles et al., 2014) which is designed to capture the dynamic evolution of teacher competencies throughout the action cycles. This framework was selected due to its recursive nature, allowing for analysis to be conducted simultaneously with data collection rather than treating it as a rigid final stage. The analytical process proceeded through three concurrent streams of activity. Initially, data condensation was performed to select, focus, and simplify the raw data gathered from observations, interviews, and lesson plan documents, enabling the identification of initial patterns relevant to the research objectives. These condensed findings were then organized into data displays, such as structured matrices and narratives, which are essential in classroom action research to clearly map pedagogical developments between cycles. Finally, the process involved conclusion drawing and verification, where tentative insights formed at the beginning of the study were continuously tested and deepened as data from subsequent cycles provided more robust evidence. This systematic approach ensures that the findings remain grounded in the empirical realities of the classroom while maintaining the flexibility required for action-based research.

Data from field notes, interview transcripts, and document analysis were condensed to identify emerging patterns and themes related to changes in teachers' pedagogical competencies and the implementation of *Ulul Albab* values. These themes were then presented in descriptive narrative form and a matrix to compare findings across cycles. A continuous verification process was conducted throughout the research through discussions with participants (member checking) to ensure accurate and credible data interpretation.

RESULT AND DISCUSSION

The Evolution of Learning Design: From Concept Embedding to Meaning Weaving

The implementation of two cycles of action research using the Kemmis and McTaggart spiral model resulted in observable shifts across three domains: instructional design, pedagogical practice, and teacher perception.

Evolution of Instructional Design

Data from Lesson Implementation Plan (RPP) documents showed a transition in how teachers structured the integration of Ulul Albab values.

Cycle 1 Findings:

In the first cycle, RPP analysis revealed a thematic-affiliative pattern. Teachers placed Quranic verses or Islamic quotes at the beginning or end of the document. For instance, a mathematics lesson plan on sequences included a verse about universal order in the Introduction section, but the Core Activities" remained focused exclusively on formula computations and procedural exercises.

Cycle 2 Findings:

Following collaborative reflection, the second cycle RPPs moved toward a conceptual-problematic model. Teachers formulated essential questions that linked scientific phenomena with theological inquiry. A Biology RPP on ecosystems, for example, used the concept of mizan (balance) as the core problem-solving theme, requiring students to analyze human impact on sunnatullah (natural laws).

A detailed comparison of this evolution of instructional design is presented in Table 1.

Table 1. Qualitative Comparison of Learning Design (RPP) Between Cycle 1 and Cycle 2

Dimensions of Learning Design	Findings in Cycle 1 (Initial Conditions)	Findings in Cycle 2 (After Intervention)
Formulation of Learning Objectives	Cognitive objectives (science/mathematics) and affective objectives (Islamic values) are written separately and are not connected.	The objectives are formulated in an integrated manner, showing the cause-effect relationship between understanding scientific concepts and experiencing spiritual values.
Value Integration Strategy	Affiliative-thematic: inserting verses or quotes at the beginning/end of the lesson as "decoration" or introduction.	Conceptual-problematic in nature: making Islamic values the core of the problems or phenomena studied in the lesson.
Quality of Starting Questions	Questions are factual and closed-ended, focusing on technical content. Example: "What is the formula for calculating velocity?"	Questions are essential and open-ended, provoking critical and reflective thinking. For example: "How does the regularity of planetary orbits reflect the concept of the sunnatullah?"

Student Activity Design	Activities center on practice questions, procedural experiments, and listening to teacher explanations.	Activities center on discussions, case studies, and problem solving that link science to ethical-spiritual and social contexts.
Evaluation Plan	Assessment focuses on cognitive aspects (written tests, quizzes) to measure understanding of scientific concepts only.	Assessment is authentic and holistic: it includes project assessments, reflective essays, or presentations that measure students' ability to synthesize knowledge and values.

The table above systematically maps the transformation in teachers' learning design abilities. A clear shift is evident from the add-on approach in Cycle 1, where Islamic values were merely complementary, to the woven-in approach in Cycle 2. In the second cycle, *Ulul Albab* values are no longer separate objects but rather become a lens through which to view and interpret the entire learning process, from objectives to assessment.

In the first cycle, teachers' efforts to integrate *Ulul Albab* values were still superficial. Analysis of lesson plan (RPP) documents revealed a pattern of thematic-affiliative integration, where relevant Quranic verses or hadith quotations were pasted at the beginning or end of learning sessions without being organically connected to core activities. A math teacher, for example, included a verse about natural order in a lesson plan on sequences and series, but the learning activities remained focused purely on formula computation exercises.

A fundamental transformation occurred in the second cycle. Driven by collaborative reflection sessions, the learning design evolved toward a conceptual-problematic integration" model. Teachers began designing learning flows that placed *Ulul Albab* values at the core of the inquiry process. For example, in a Biology lesson plan on ecosystems, one teacher formulated the provocative question: "*If Allah created ecosystems in balance (mizan), how can irresponsible human activity be considered a disruption of the sunnatullah, and what is our role as khalifah (vicegerent) in restoring it?*" This question inherently interweaves scientific concepts (ecosystem balance) with theological concepts (*mizan, sunnatullah, khalifah*), encouraging students to think at a higher level.

Transformation of Classroom Pedagogical Practices

Field observations during the Acting and Observing stages recorded changes in classroom discourse and teacher-student roles.

Teacher Role: In *Cycle 1*, teachers predominantly acted as information transmitters. In Cycle 2, there was an increase in the frequency of open-ended questions and dialogue moderation.

Value Discourse: Observations in Cycle 1 noted awkward transitions when teachers moved from scientific content to spiritual reflection. In Cycle 2, teachers utilized more fluid analogies. A math teacher was observed using the mathematical concept of "infinity" to facilitate a discussion on the attributes of God.

Tensions and Challenges (Counter-evidence): Despite the overall progress, the observation data also highlighted persistent challenges. In Cycle 2, at least two teachers reported difficulty in managing time when students' spiritual reflections became too lengthy, leading to some scientific curriculum targets being rushed. Additionally, some students

remained silent during reflective sessions, indicating that the shift to a "facilitator" role did not immediately engage all student archetypes.

Table 2. Comparison of Pedagogical Practices in Class Between Cycle 1 and Cycle 2

Aspects of Pedagogical Practice	Observation in Cycle 1	Observation in Cycle 2
The Role of Teachers	Dominant as a transmitter of information (sage on the stage). The teacher explains a lot, while students are more passive recipients.	Shifting to a dialogue facilitator (guide on the side), the teacher asks more questions, sparks discussion, and moderates student debates.
Discourse on Value Integration	It felt awkward and segmented. Values discussions took place in separate sessions and often didn't flow naturally with the core material.	Flowing and contextual. Teachers are able to spontaneously use analogies and metaphors to connect science/mathematics concepts with spiritual reflection.
Student Engagement	Involvement is instrumental: students are active when working on problems or experiments, but tend to be passive when discussing grades.	Engagement is both intellectual and emotional: students actively ask questions, express opinions, and share personal reflections on the relationship between science and faith.
Responses to Student Questions	Teachers tend to answer "off-topic" questions (related to values/faith) briefly or postpone them.	The teacher welcomed the question as a golden opportunity to deepen the discussion and demonstrate the relevance of the subject matter to students' lives.

This table illustrates the tangible impact of the Lesson Study intervention at the implementation level. The changes from Cycle 1 to Cycle 2 demonstrate that teachers are not only able to design better lesson plans, but also have the confidence and skills to execute them effectively. The teacher's shift from preacher to facilitator is key to successfully creating a learning environment that truly integrates fikr (thought) and dhikr (remembrance). Changes in the lesson design directly impact classroom practice. Observations in the first cycle recorded interactions that were still teacher-dominated. Attempts to discuss Islamic values often felt awkward and disconnected from the main material. A physics teacher commented during a reflection session: "*I tried to connect the material about gravity to God's power, but it felt like an extra lecture. The students were just silent, perhaps they were confused about how it related to the formula we were studying.*"

In the second cycle, the classroom dynamics changed dramatically. The teacher was no longer the sole source of knowledge, but rather acted as a facilitator of dialogue. They became more skilled at using analogies and metaphors to bridge the scientific and spiritual worlds. In a math lesson on the concept of infinity, the teacher sparked discussion by saying: "*The concept of infinity in mathematics helps us to imagine the infinite nature of God, although of course His nature cannot be equated with mathematical concepts. What can we reflect on from this?*"

The use of reflective questions like this successfully creates space for students to engage in contemplation (*dzikr*) while reasoning logically (*fikr*), which is the essence of the *Ulul Albab* framework.

Teacher Internalization and Psychological Shifts

The most profound, though least visible, transformation was the psychological shift that occurred within the teachers. In-depth interviews conducted before and after the intervention revealed a process of internalization of the *Ulul Albab* value framework. Initially, the task of integrating Islamic values was perceived as an external obligation or an additional burden on top of the already demanding curriculum. One teacher revealed in an initial interview:"*Honestly, I'm worried that the material targets won't be met if we have to add discussions about Islamic values. It feels like more work, and our time is limited. I'm also not very confident discussing things outside my field.*"

This quote reflects common initial challenges: time constraints, curriculum pressures, and a lack of confidence in domains outside their specialization. However, after two collaborative and reflective Lesson Study cycles, a fundamental paradigm shift occurred. Teachers no longer viewed values integration as an additional task, but rather as a new pedagogical lens that enriched the way they viewed and taught their discipline. This was clearly illustrated by a statement from a science teacher in the final interview:

> "I used to think that teaching biology was about facts, about cell mechanisms, about ecosystems. Now I realize that teaching photosynthesis is not just about chlorophyll and ATP. It's an opportunity to show the wonder and order of God's creation in a single leaf. This lesson study process has changed the way I view my own subject. It's no longer a burden, but instead makes my teaching more lively and meaningful."

This statement is strong evidence of internalization. The *Ulul Albab* framework has shifted from a foreign concept to an integral part of teachers' professional identities. They no longer teach about values but rather teach with values, where their worldview is authentically embodied in every aspect of their pedagogical practice.

In-depth interviews conducted after the completion of both cycles revealed an internal shift within the teachers. Initially, some teachers viewed the values integration assignment as an additional burden on top of an already dense curriculum. However, after going through a collaborative Lesson Study process, this view changed. Teachers began to view the *Ulul Albab* framework not as extra content, but as a new pedagogical lens through which to view and teach their discipline. One science teacher stated in the final interview:

> "Now I realize that teaching photosynthesis isn't just about chlorophyll and ATP. It's an opportunity to show the wonder of God's creation in a single leaf. This lesson study has changed the way I view my own subject. It's no longer a burden, but rather an enrichment to my teaching."

This statement indicates the occurrence of internalization of values, where the principles of Ulul Albab have become part of their professional identity.

Disscussion

The transformation of teacher competencies from a fragmented add-on integration to an organic woven-in model (as shown in Table 1 and 2) suggests that the Lesson Study framework serves as more than just a collaborative tool; it functions as a disruptive pedagogical mirror. Unlike conventional Lesson Study which often focuses on technical instructional efficiency (Jauhari et al., 2025; Johari et al., 2024), this study demonstrates that when infused with the Ulul Albab framework, the reflective process shifts from how to teach to why we teach.

The Collaborative Reflection as a Catalyst for Paradigm Shift

The transition observed in Cycle 2, where teachers began using conceptual-problematic questions highlights a significant departure from standard integration practices. Empirically, the first cycle failed because teachers treated Ulul Albab values as external ornaments (thematic-affiliative). The awkwardness recorded in field observations (Cycle 1) confirms that a top-down mandate to integrate values often results in pedagogical dissonance.

However, the collaborative reflection sessions acted as a turning point. In these sessions, the tension between scientific content and spiritual values was not avoided but debated. This aligns with the essence of a learning community where mutual learning occurs (Ma'arif & Arif, 2026), yet this research adds a new empirical layer: integration is a cognitive-emotional process. The shift only occurred once teachers felt a sense of professional agency to re-interpret their subject matter through a spiritual lens, rather than just following a rubric.

Tensions and the Partial Success of Integration

Critical dialogue with the findings reveals that the integration of fikr (thought) and dhikr (remembrance) is not without friction. While the second cycle showed a conceptual leap, the data also identified pedagogical exhaustion and time-management issues. This suggests that the Ulul Albab model, while high in meaningfulness, is demanding in execution (Sarkowi, 2024).

The fact that some students remained passive despite the teacher's shift to a facilitator role indicates that a change in teacher competency does not automatically result in a change in student habitus. This partial success highlights a gap in current Lesson Study literature: the assumption that improved teacher design leads linearly to improved student engagement. In reality, the integration of values requires a longer incubation period for students to move beyond surface-level responses to deep reflective inquiry.

Redefining Professional Identity

The most significant empirical finding is the movement from teaching about values to teaching with values. This suggests that Lesson Study in this context serves as a vehicle for Internalization. When a science teacher views photosynthesis as a manifestation of mizan, they are no longer just delivering a curriculum; they are enacting their professional identity. This study argues that for holistic education to work, the Ulul Albab framework must not be treated as additional content which teachers initially perceived as a burden but as a pedagogical lens that simplifies rather than complicates the teaching process.

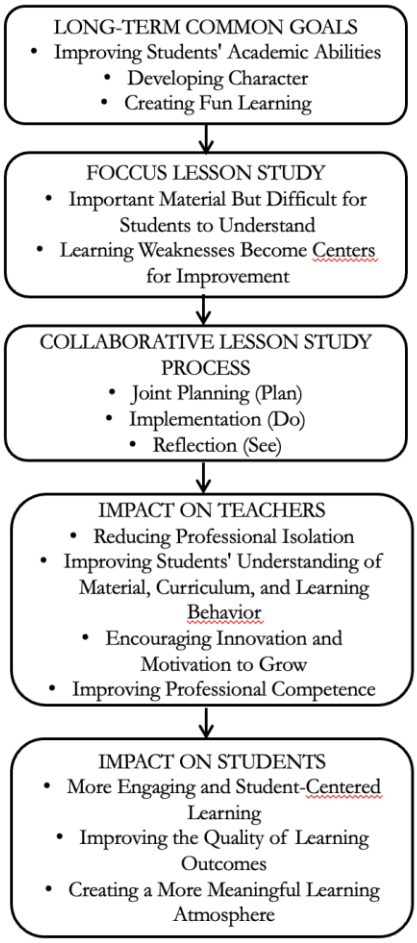

Figure 1. Lesson Study Ulul Albab Value

Analysis of the Lesson Study Framework

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The diagram illustrates a systematic, impact-oriented Lesson Study framework that functions as a vehicle for Transformative Professional Development. Unlike traditional top-down training, this framework aligns with the theory of Social Constructivism, where teacher competence is not received but constructed through collaborative social interaction and shared goals. The process begins with the establishment of holistic, long-term shared goals, which serve as the teleological foundation of the learning community. This shared vision ensures that the development of student character and a conducive environment are not peripheral, but central to the pedagogical objective (Badawi, 2025; Hussain, 2025; Miftah et al., 2024).

At the core of this framework is the collaborative identification of learning weaknesses. In theoretical terms, this stage is a collective exercise in developing Pedagogical Content Knowledge (PCK) the unique intersection where a teacher's subject matter expertise meets an understanding of how students learn or struggle with specific concepts. By focusing on subject matter that is important but difficult, teachers engage in what Schön (1983) calls reflection-on-action, ensuring that the energy and time invested address real classroom needs rather than abstract pedagogical theories.

The heart of this framework the Plan-Do-See cycle represents an iterative loop of Action Learning. *Plan*: This stage is a collaborative design of instructional scaffolds based on predicted student responses. *Do*: The implementation serves as a living laboratory where the lesson design is tested in real-time. *See*: The reflection stage is the most critical, shifting the focus from teacher performance to student learning evidence.

Consistent implementation of this process facilitates a Paradigm Shift (Kuhn, 1962). Instead of viewing teaching as an isolated technical act, teachers begin to see it as a transparent, peer-reviewed, and continuously evolving practice. This theoretical alignment explains why the framework is effective: it bridges the gap between theoretical values (Ulul Albab) and classroom reality through a structured, evidence-based social process.

Professionally, it can reduce the sense of isolation often experienced by educators, as they now have a community to share and discuss. Pedagogically, Lesson Study has been shown to deepen teachers' understanding of the material, curriculum, and student learning behavior. This, in turn, encourages innovation and increases teachers' internal motivation for continuous growth, which cumulatively enhances their overall professional competence. The positive impact on teachers is directly felt by students. More thoughtfully and collaboratively designed lessons tend to be more engaging and student-centered. The quality of learning outcomes also improves along with improvements in the process. Furthermore, this cycle of improvement contributes to a more meaningful learning atmosphere, where students not only learn the material but also experience a profound and enjoyable process of discovery.

One of the essential characteristics of lesson study is the existence of a long-term shared goal that the group wants to achieve (Wolthuis et al., 2020). These goals can vary, from improving students' academic abilities to developing character, to creating more enjoyable learning. Furthermore, lesson study often focuses on subject matter deemed important but difficult for students to grasp (A. Aziz et al., 2025; Huda et al., 2024). By focusing on weak points in learning, teachers can collaboratively find the most effective solutions. Consistently implementing lesson study provides significant benefits for both educators and students. For teachers, this activity can reduce feelings of isolation in their profession, as it provides a space to discuss and design learning with colleagues. This collaborative process has also been shown to deepen teachers' understanding of subject matter, curriculum, and how to more effectively observe student learning activities (Amirullah & Iksan, 2018; Subasman, 2024). Furthermore, lesson study encourages improved lesson plan quality, motivates teachers to continuously develop, and ultimately enhances their overall professional competence. These positive impacts directly impact students. With more carefully designed and student-centered learning, the quality of their learning improves. Ultimately, the continuous improvement cycle that underlies lesson study contributes to the systematic improvement of educational quality.

In Islamic thought, *Ulul Albab* is a concept that refers to the ideal, perfect human being. This term, mentioned sixteen times in the Quran, can literally be translated as possessors of pure reason or those who possess the essence of intelligence. (Husin et al., 2020). Interpretation experts interpret *Ulul Albab* not simply as individuals who are intellectually intelligent. More than that, they are individuals whose minds are clear, not shrouded in the fog of thought that can cause confusion, so they are able to grasp the essence of everything (Syam, 2017). This concept depicts a sublime level that harmoniously combines

two primary human potentials: the power of thought (*pikir*) and spiritual depth (*zikir*). Ulul Albab individuals do not separate their intellectual activities from their spiritual awareness of God. They are individuals who use their reason and intellect to contemplate the signs of God's greatness in the universe, or the *kauniyah* verses, while diligently studying His word in the holy book, or the *qauliyah* verses. *Ulul Albab* are representatives of the perfect human being who is able to balance intellectual, emotional, and spiritual intelligence in all aspects of their lives (Muhsinin, 2019). The character of an *Ulul Albab* is built on a foundation of noble values reflected in their attitudes and behavior. These values do not stand alone, but are interconnected, forming a complete personality (Sinaga, 2016).

Critical Analysis: Operationalizing Ulul Albab in a Global Pedagogical Context

The integration of Ulul Albab values transcends mere religious instruction; it aligns with the global movement towards Holistic Education and Global Citizenship Education (GCED). However, to move beyond normative discourse, these values must be translated into measurable pedagogical benchmarks and operationalized through structured classroom interventions.

From Scholarship to Critical Information Literacy

The spirit of scholarship in Ulul Albab is empirically equivalent to High-Order Thinking Skills (HOTS) and Critical Information Literacy. In a global era defined by post-trut and algorithmic bias, the ability to weigh and sift through various arguments (Taqiyuddin, 2020) is no longer just a spiritual virtue, but a survival skill.

Operationalization: This is measured through students' ability to perform Source Criticism and Logical Fallacy Detection. In the classroom, this is implemented via Inquiry-Based Learning where students are assessed on their ability to synthesize conflicting data sets rather than merely memorizing facts.

Translating Dhikr into Reflective Metacognition

The synthesis of fikr (*thought*) and dhikr (remembrance) can be translated into the secular-academic framework of Metacognitive Reflection. While dhikr provides the spiritual grounding, its operational form in a global classroom is the Reflective Loop.

Implementation: This is measured through Reflective Journals or Portfolios. Students are not only graded on the correctness of their scientific answers but on their ability to articulate the ethical and existential implications of that knowledge. For example, in a physics lesson on entropy, the dhikr component is operationalized as a discussion on the finiteness of resources and environmental stewardship (*khalifah*).

Moral Integrity as Social-Emotional Learning (SEL)

The social concern and moral integrity of Ulul Albab mirror the internationally recognized Social-Emotional Learning (SEL) framework. The pioneers of improvement (Sufirmansyah, 2023) are analogous to Social Entrepreneurs or Change Agents in modern educational theory.

Scalability: To make this measurable, schools can adopt Service-Learning models. Success is not measured by a written test on integrity, but by the execution of community-based projects where students apply their technical knowledge (e.g., mathematics or biology) to solve local social problems.

Wisdom (Hikmah) as Ethical Decision-Making

Finally, Hikmah is the pinnacle of Ethical Leadership. In a globalized professional world, this translates to the ability to navigate wicked problems where there is no single right answer.

Critical Perspective: The challenge in global implementation is avoiding moral relativism. The Ulul Albab framework provides a fixed ethical North Star while maintaining the flexibility (hikmah) to adapt to diverse cultural histories. Operationally, this is taught through Case-Study Analysis where students must propose solutions that balance technical efficiency, environmental sustainability, and social justice.

The findings of this study comprehensively demonstrate that the Lesson Study model modified with the *Ulul Albab* values framework serves as an effective catalyst for the development of teachers' pedagogical competence in the context of religious schools. The success of this model cannot be attributed to a single element, but rather to the strong synergy between the collaborative structure of Lesson Study, the philosophical depth of the *Ulul Albab* framework, and the critical reflection process at its heart. This process creates a safe ecology of professional development where teachers can experiment, acknowledge limitations, and build new competencies alongside their colleagues, in line with the concept of a community of practice (Julien & Daniel, 2017).

The shift from patchwork to weaving integration (as shown in Table 1) and the transformation of the teacher's role from information provider to reflection facilitator (Table 2) are manifestations of in-depth professional learning. This model effectively dismantles teachers' initial assumption that values integration is a separate task. Through planning discussions and reflection, they discovered that authentic integration occurs when values become the common thread that unites objectives, content, activities, and assessments. This aligns with the arguments of character education experts who state that effective values education must be integrated, not taught as a separate subject (Bahri et al., 2023).

Lesson Study and Its Implications

The fundamental novelty of this research lies in the empirical evidence that Lesson Study can be reengineered into a mechanism for values-oriented pedagogical transformation, not simply a technical improvement. Meanwhile, existing literature has established Lesson Study as an effective method for improving pedagogical content knowledge (Amirullah & Iksan, 2018; Deda et al., 2023; Subasman, 2024). This research is one of the first to demonstrate its role as a vehicle for developing a pedagogical-spiritual synthesis. We argue that this model is successful because it shifts the focus from what teachers do to who teachers are. This process encourages a shift from simply teaching values (Hasbi et al., 2025). to become teaching with values (Arisal et al., 2024; A. Aziz et al., 2025; Permadi et al., 2025), where the teacher's ethos and worldview are authentically integrated into his or her pedagogical practice.

This contribution directly addresses a gap in the literature on the integration of Islam and science. While previous studies have often been normative and theoretical, this research offers a proof-of-concept of a replicable intervention model. We demonstrate that the synthesis of faith and reason in education does not have to stop at the discourse level but can

be systematically operationalized at the classroom level through structured and reflective professional development.

Significantly, these findings challenge the view that improving academic quality and strengthening religious identity are two separate or even competing agendas (Laoli et al., 2022; Prasetyawati & Astuti, 2025). On the contrary, this research shows that when spiritual values are deeply and intelligently integrated, it can actually increase student engagement and deepen their conceptual understanding. Science and mathematics learning becomes more relevant and meaningful, no longer seen as dry subjects detached from their lives.

Lesson study is built on several fundamental principles that distinguish it from other professional development models. The primary principle is collegiality, which places all parties involved, both model teachers and observers, on equal footing as fellow learners. The second principle is collaborative learning, which emphasizes that each activity aims to benefit and educate all group members. These two principles then form a learning community, an environment where teachers consistently and systematically strive to improve their teaching practices.

The practical implications of these findings are clear for educational policymakers and school leaders, particularly in faith-based educational settings. This research confirms that investing in collaborative, ongoing, and contextual teacher professional development programs like the proposed model is far more effective than single, top-down instructional training. To replicate this success, schools need to consciously cultivate space and time for teachers to dialogue, reflect, and innovate together. Furthermore, the Ulul Albab-based Lesson Study model resonates strongly with contemporary pedagogical trends that seek to go beyond surface learning. This model aligns with the idea of deep learning, which emphasizes the achievement of awareness, meaning, and happiness in learning (Blegur et al., 2024; Habil et al., 2025). Through its reflective cycle, teachers are guided to design experiences that not only transfer information but also spark students' awareness of the connection between knowledge and life and the Creator, thus transforming the learning process into a joyous journey of meaningful discovery.

Furthermore, this approach can also be seen as a practical manifestation of a love-based curriculum. Ulul Albab values, which emphasize wisdom, caring, and moral responsibility, encourage teachers to build pedagogical relationships based on compassion and sincerity. The collaborative process in Lesson Study itself is an exercise for teachers to love one another in the form of professional support, creating a more humane school ecosystem. Ultimately, this research offers a proven blueprint for educating a generation that is not only academically competent but also possesses the character of Ulul Albab: individuals who are able to use their reason to contemplate creation and use their faith to guide every action.

CONCLUSION

This study reveals a significant and somewhat unexpected pedagogical shift in how teachers integrate the Ulul Albab framework within the Lesson Study cycle. Rather than maintaining an add-on approach where spiritual values are appended superficially to scientific content teachers gradually developed a meaning-weaving model in which both domains are organically interconnected. This transformation was largely facilitated by collaborative

reflection in the Plan-Do-See cycle, which helped teachers identify moments of pedagogical friction points where scientific reasoning and spiritual reflection appeared disconnected—and co-construct analogies to bridge them. An important emergent finding is the shift in teacher roles from information transmitters to facilitators of dialogic learning. However, this transformation proved to be cognitively demanding and time-intensive, indicating that such integration is not automatic but requires sustained reflective practice.

This research contributes to the field at a micro-pedagogical level by offering a new perspective on teacher professional development and curriculum integration. It supports and extends previous studies on reflective practice and Lesson Study by demonstrating that integration of values and content is most effective when treated as a collaborative inquiry process rather than a top-down directive. The study challenges the assumption that pedagogical integration can be achieved through standardized training alone, instead emphasizing the importance of situated, teacher-driven meaning-making. Furthermore, it introduces the concept of "pedagogical friction" as a useful analytical lens for understanding integration challenges and opportunities. Methodologically, the study reinforces the value of action research and iterative cycles (Plan-Do-See) as tools for transforming teacher identity and instructional design in context-sensitive ways.

This study is limited by its small sample size and its focus on a single madrasah, which restricts the generalizability of the findings. The research duration, covering only two Lesson Study cycles, does not allow for conclusions regarding long-term sustainability. Additionally, variations in teacher characteristics such as experience, gender, and educational background—were not systematically analyzed. Contextual constraints, including school culture and voluntary participation, also influence the outcomes. These limitations highlight the need for further research using longitudinal designs to examine sustained impact over time, as well as quantitative or mixed-methods approaches to measure effects on student learning outcomes. Future studies should also explore the scalability of this model across different subjects and educational levels, and investigate its influence on students' habitus particularly how integrated scientific and spiritual values are internalized over an extended period.

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