

Deep Learning Architecture in *Pesantren*: a Systematic Literature Review Integrating Mindful, Meaningful, and Joyful Pedagogy toward Indonesian Islamic Education

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ABSTRACT

Indonesia's deep learning policy emphasizes mindful, meaningful, and joyful learning, yet its relationship with the long-established pedagogical traditions of pesantren remains insufficiently synthesized. This study examines how these three dimensions are represented in Indonesian pesantren pedagogy and develops a contextually grounded conceptual framework. A Systematic Literature Review was conducted following PRISMA 2020 and PRISMA-S guidelines. Scopus was searched for peer-reviewed studies published between 2017 and 2026. Of 89 identified records, 24 studies met the eligibility criteria and were included in the thematic synthesis. Methodological quality was appraised using the Mixed Methods Appraisal Tool (MMAT), while thematic coding examined evidence of mindful, meaningful, and joyful learning. Meaningful learning was identified in all 24 studies, followed by joyful learning in 20 and mindful learning in 19. Across the reviewed literature, meaningful learning was reflected in contextual understanding, knowledge application, and ethical formation; mindful learning in reflective awareness, spiritual discipline, self-regulation, and adab; and joyful learning in dialogic, participatory, affective, and socially supportive interactions. The synthesis generated the "Golden Triangle of Pesantren Deep Learning," an interpretive framework connecting these dimensions with pesantren's cognitive, spiritual, and affective pedagogical practices. Pesantren pedagogy exhibits characteristics consistent with contemporary deep learning principles while foregrounding spiritual engagement and relational learning. The proposed framework offers a context-specific contribution to discussions of holistic pedagogy and Indonesian educational reform.

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1. INTRODUCTION

Indonesia's existence in facing the convergence of future challenges demands fundamental readiness, especially through reorientation in the national education sector. Current global dynamics are characterized by volatility, complexity, and ambiguity, which are massively triggered by the acceleration of science and technological disruption. However, the pedagogical reality in Indonesia still shows a contradictory persistence in conventional traditional paradigms. Instructional practices in the field are often dominated by one-way transmission of information through lecture methods, which inherently limits dialectical space. In addition, an evaluation system that still focuses on memorization or *surface learning* risks inhibiting higher-level cognitive growth. This condition creates a significant gap in the development of essential competencies, given that the existing learning ecosystem has not optimally facilitated the sharpening of critical reasoning and the stimulation of original creativity in students in responding to complex global realities (Kementerian Pendidikan Dasar dan Menengah, 2025a).

As a strategic response to global dynamics, the Ministry of Primary and Secondary Education of the Republic of Indonesia has issued Regulation Number 13 of 2025. This regulation serves as a fundamental amendment to Minister of Education, Culture, Research, and Technology Regulation No. 12 of 2024, which previously regulated the curriculum framework for primary and secondary education (Kementerian Pendidikan Dasar dan Menengah, 2025b). The core of this new policy is the introduction of the "*deep learning*" paradigm as the main instructional methodology that reconstructs the educational process through three philosophical pillars: mindfulness, meaningfulness, and joyfulness. Through this framework, the national education system is shifting from merely transmitting information to creating a more reflective and adaptive learning ecosystem for students (Sudirman & Pandang, 2025).

Meanwhile, as an Islamic educational institution with strong cultural and structural autonomy, Islamic boarding schools offer a highly distinctive educational ecosystem (Burga & Damopolii, 2022). The unique characteristics inherent in the *pesantren* tradition, which integrates local wisdom values with spiritual depth, position this institution as a highly potential entity to function as a natural laboratory for the implementation of the *deep learning* paradigm. The pedagogical flexibility and relational closeness between educators and students in the *pesantren* environment enable a learning process that not only touches on cognitive aspects but also facilitates the internalization of values in a reflective and contextual manner (Kusumaningrum, Gunawan, Sumarsono, & Latifah, 2025). Thus, *pesantren* have a solid sociopsychological foundation for transforming learning experiences into more meaningful and conscious ones, in line with the principles of deep learning that demand active involvement and a holistic understanding of the realities of life.

A review of the current literature shows a scarcity of studies that specifically integrate the *deep learning* paradigm into the *pesantren* education ecosystem. A bibliometric search on the Scopus database using related keywords identified only one reference study, namely the work of (Ruldeviyani et al., 2024), which explores this intersection. However, this scientific contribution is still fragmentary because its scope is limited to the correlation between the *Pegon* writing method and the concept of *deep learning*. This phenomenon indicates that the discourse on the systemic and methodological application of deep learning in the broader context of *pesantren* pedagogy has not received adequate attention in global literature.

Meanwhile, in the smaller national landscape, through the Sinta database, there are several studies that highlight this theme. Some of the studies found include: (Maimun, Hamdani, Listiana, & Lape, 2025), (Muzakir, Akhirudin, Idham, & Samiyono, 2025), (Hikmayati, Nuraeni, Hernandi, Sudrajat, & Selamat, 2025), (Wafi, Soraya, & Kurjum, 2025), (Husen, Abdi, & Zaironi, 2026). However, all of these studies are still very limited and partially fragmented. For example, some discuss a specific method, namely *sorogan* and its relationship with deep learning, while others only discuss the implementation of deep learning in certain *Pesantren*.

The scarcity of literature on this subject opens up crucial academic opportunities to conduct comprehensive investigations into the synergy between the pedagogical architecture of Islamic boarding schools and the *deep learning* paradigm. The main focus of this research is directed at an in-depth analysis

of the traditional instructional system of Islamic boarding schools and its relevance to the three main pillars of deep learning, namely the dimensions of mindfulness, meaningfulness, and joyfulness. Through this systemic exploration, it is hoped that it will be revealed how the autonomous structure of *pesantren* education is able to integrate local wisdom values into a contemporary pedagogical framework that is more transformative and adaptive to the complexities of the times.

The question to be answered in this study is the extent to which the *pesantren* pedagogical system implemented in Indonesia relates to the three main pillars of deep learning. It also examines which of these three pillars is most frequently represented across the reviewed literature and how each is manifested in *pesantren* pedagogy. Based on these questions, facts related to the research theme will be revealed, resulting in a map of the three pillars of deep learning in Islamic boarding schools. Ultimately, a design and framework for deep learning from the perspective of *Pesantren* education will be presented. In the end, policies regarding deep learning will not only be implemented in formal education, but more than that, traditional Islamic education, especially Islamic boarding schools, will also contribute to efforts to accelerate the quality of education in Indonesia.

2. METHODS

This study applied the *Systematic Literature Review* (SLR) method by adopting the *Preferred Reporting Items for Systematic reviews and Meta-Analyses* (PRISMA 2020) protocol as the main framework for synthesizing literature on pedagogical practices in Indonesian *Pesantren*'s (Page et al., 2021). To ensure accountability and replication of the research, all literature search procedures were rigorously documented in accordance with the PRISMA-S (*PRISMA Search Reporting Extension*) standards (Rethlefsen et al., 2021). The integration of these two international standards aims to provide high methodological transparency and ensure validity in comprehensively mapping the instructional landscape and educational dynamics developing in Islamic boarding schools.

This section presents the results of implementing the SLR and PRISMA-S protocols to map how these pillars are manifested in the literature on *pesantren* pedagogy in Indonesia over the last 10 years (2017-2026). This synthesis process aims not only to document existing practices but also to identify the extent to which *pesantren* traditions have organically adopted deep learning principles prior to the official launch of the 2025 national policy. Scopus was used as the sole bibliographic database for identifying records included in the review.

The final Scopus search was conducted on 05 May 2026. The search covered publications from 2017 through 2026 and was executed using the following search string and keywords: ("Pesantren" OR "Islamic boarding school" OR "traditional Islamic school") AND ("learning principle" OR "pedagog*" OR "learning method") and ("Bandongan" OR "Sorogan"). Google Scholar did not contribute additional records to the review corpus; it was used only as a supplementary locator when checking citation trails or full-text availability. Accordingly, all 89 records entering the identification stage originated from Scopus.

The literature screening process was conducted semi-automatically using the Rayyan AI platform to support consistent title-and-abstract screening. From 89 records identified in Scopus, 4 duplicate records were removed, leaving 85 records for screening. At the title-and-abstract stage, 23 records were excluded, so 62 reports were sought for retrieval. Four reports could not be retrieved, leaving 58 full-text reports for eligibility assessment. Of these, 34 were excluded at full text (wrong publication type, n=12; wrong study design, n=3; wrong context, n=19), resulting in 24 studies included in the final synthesis. The eligibility criteria and exclusion reasons were specified as follows:

Inclusion criteria: studies were eligible when they (I1) were published between 2017 and 2026; (I2) were peer-reviewed journal articles indexed in Scopus; (I3) examined *pesantren*/Islamic boarding school settings in Indonesia; (I4) addressed learning principles, pedagogy, or learning methods relevant to the review question; and (I5) had sufficient full-text information for eligibility and appraisal.

- **E1:** Duplicate records (n=4): Duplicate bibliographic records were removed before screening to prevent double-counting of the same study.

- **E2:** Does not research pesantren (n=13): Eliminating articles that did not research pesantren, such as those on formal schools and non-pesantren institutions in general.
- **E3:** Outside the 10-year review period (n=6): Records published before 2017 were excluded to maintain the prespecified 2017-2026 time window.
- **E4:** Non-Indonesian pesantren context (n=4): Studies conducted in Islamic boarding-school settings outside Indonesia were excluded to preserve the national context of the review.
- **E5:** Full text not retrieved (n=4): Reports whose full text could not be obtained through available repositories, subscriptions, or author-access routes were recorded as reports not retrieved and were not assessed for eligibility.
- **E6:** Wrong publication type (n=12): Non-journal materials, including conference proceedings, book chapters, reviews, editorials, and other non-article publication types, were excluded at full-text eligibility.
- **E7:** Wrong study design (n=3): Reports were excluded when the design or reporting did not provide empirical or analytically adequate evidence for answering the review question, including failure to satisfy the basic MMAT screening questions at eligibility.
- **E8:** Wrong context (n=19): Studies were excluded when the topic was not directly related to pesantren learning principles, pedagogy, or learning methods, including work centered on higher education (Ma'had Aly), economic empowerment, health services, or other non-instructional activities.

The sequential counts are therefore internally consistent: 89 identified - 4 duplicates = 85 screened; 85 - 23 excluded = 62 sought for retrieval; 62 - 4 not retrieved = 58 assessed for eligibility; and 58 - 34 full-text exclusions = 24 included studies.

Methodological quality was integrated into the eligibility stage using the Mixed Methods Appraisal Tool (MMAT), version 2018. MMAT was selected because the review corpus contains qualitative, quantitative, and mixed-methods studies and therefore requires a design-sensitive appraisal framework. The two MMAT screening questions were applied first to establish whether each report stated a clear research question and provided data capable of addressing that question. Studies that passed these screening questions were then assessed using the five criteria corresponding to their study design, with criterion-level judgments recorded as Yes, No, or Can't tell. No single percentage or composite quality score was used; instead, the appraisal was used to establish methodological adequacy for inclusion and to calibrate the confidence placed on individual studies during synthesis. The completed MMAT appraisal matrix for A01-A24 should be inserted immediately below this paragraph.

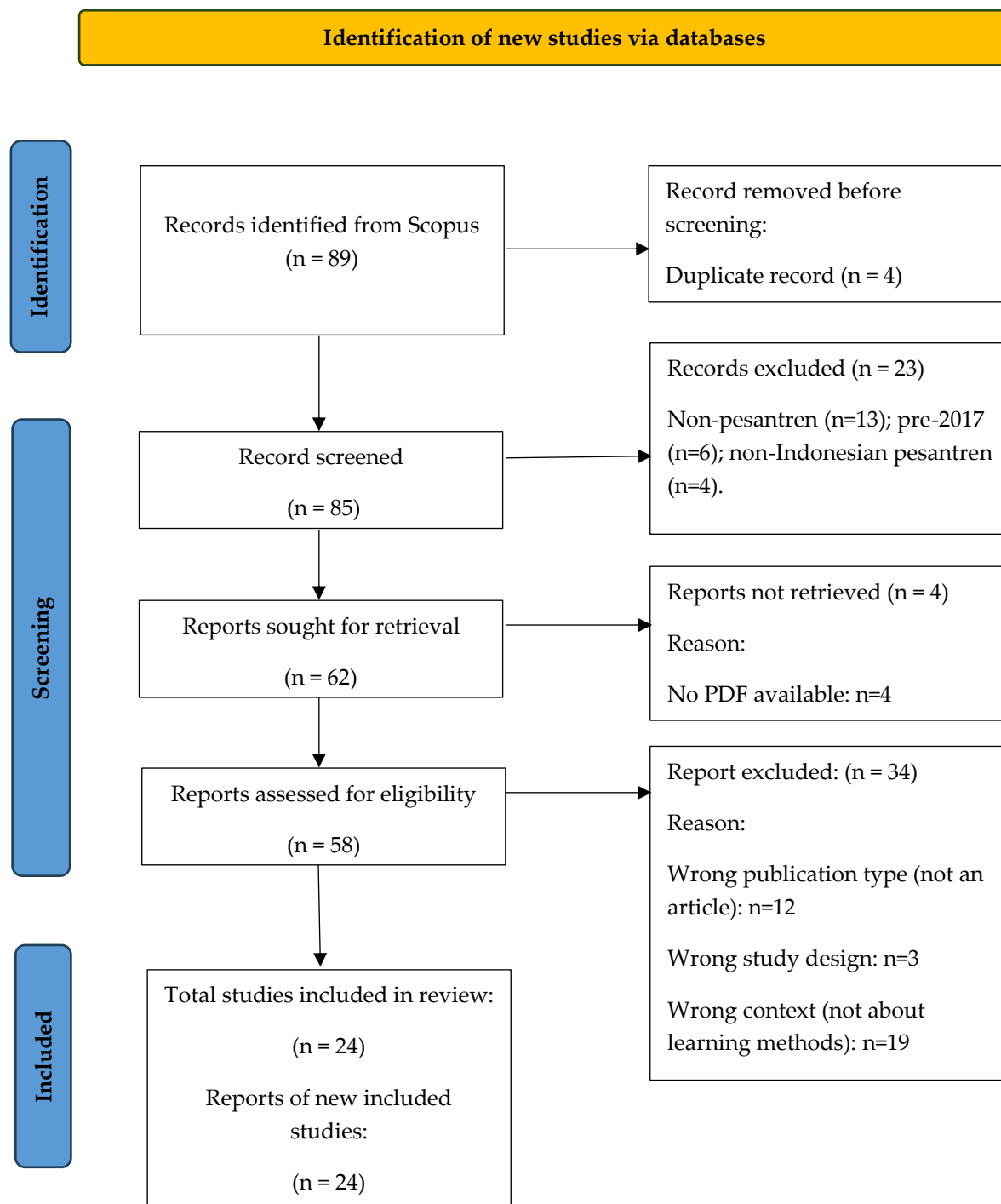


Figure 1. The Prisma Flow Chart

After determining which studies met the eligibility criteria, the procedure moved on to the data extraction phase, which aimed to synthesize fundamental information and key categories from the selected literature. To ensure the reliability of the results and reduce disparities in interpretation between authors, this extraction protocol was implemented through a systematic coding scheme based on Creswell's framework (Creswell, 2015). The use of this technique is crucial to minimize the risk of human error and ensure that all data extracted is highly consistent before further analysis. Through a measurable coding approach, researchers can build a strong foundation for interpretation by reducing subjective variability during the data categorization process.

This data analysis process is carried out through three sequential and interrelated stages. The first phase begins with *open coding*, in which researchers conduct an in-depth inspection of the data to produce initial descriptive labels without being influenced by prior theoretical assumptions. This step is then followed by *axial coding*, which serves to explore the connections between these initial codes in order to form more substantive and comprehensive themes. Finally, *selective coding* is performed to filter and integrate all existing categories into a single coherent core concept. The transformation of data from raw information into conceptual findings ensures that the resulting literature synthesis accurately and meaningfully represents the phenomenon under study.

For thematic classification, Mindful was coded when a study contained sufficiently explicit evidence of reflective or spiritual awareness, attentional discipline, self-regulation, adab, or related forms of conscious engagement; Meaningful was coded when learning was connected to conceptual understanding, prior or lived knowledge, contextual application, ethical relevance, or character formation; and Joyful was coded when the study described dialogic or participatory interaction, positive affect, social-emotional engagement, learner agency, or a psychologically supportive learning atmosphere. The three categories were non-mutually exclusive, so one article could receive more than one code. A missing code indicates that the dimension was not sufficiently explicit for coding, not that the dimension was definitively absent from the learning setting.

3. FINDINGS AND DISCUSSION

3.1 Systematic Synthesis: Mapping of Deep Learning Pedagogical Landscape in Indonesian Pesantren

The initial section will present a comprehensive synthesis of the literature database that has undergone a rigorous selection process, which ultimately identified 24 selected studies as the core of the systematic review analysis in this study. The data is described systematically to provide a holistic picture of the characteristics of each study, including methodological parameters, publisher, aim of study, and crucial findings relevant to the research questions posed. Through mapping the data from the 24 articles, the structure of the evidence collected allows for in-depth comparisons between studies, facilitating the identification of significant patterns and gaps in the existing literature. Therefore, the presentation of this data serves not only as an inventory of documents, but also as an essential empirical foundation for the process of integrating and interpreting the research results as a whole.

Table 1. Primary Studies Included in this Systematic Review

Article Code	Author and Publication Years	Article Title	Aim of Study	Publisher
A01	(Maragustam, 2019)	PENGEMBANGAN INPUT SANTRI BARU BERBASIS ADAPTASI-KARANTINA (STUDI ANALISIS SANTRI BARU DI PESANTREN YANAABII'UL QUR'AN KUDUS)	The aim of the study is to investigate the development of new students' adaptation based on a quarantine system, focusing on how they adapt, the forms of adaptation, and the factors influencing their ability to adapt.	Jurnal Pendidikan Agama Islam

A02	(Marpuah, 2019)	The mastery of Arabic language communication with communicative active method	The aim of the study is to investigate how the Active Communicative Method (KAK) can assist students in mastering Arabic speech, identify the problems faced during its implementation, and design alternative learning methods for Arabic language education	Humanities and Social Sciences Reviews
A03	(Syukur, 2019)	TEACHING METHODS IN PESANTREN TO TACKLE RELIGIOUS RADICALISM	The aim of the study was to investigate the teaching methods applied in pesantren as an effort to tackle religious radicalism in Indonesia.	Jurnal Pendidikan Islam
A04	(Abidin, 2020)	Educational Management of Pesantren in Digital Era 4.0	The aim of the study is to improve the skills of students at Pondok Pesantren Modern Darussalam Gontor 12, enabling them to be highly competitive with graduates from public schools. It examines the educational management and learning methods implemented to support these skills, particularly in the context of e-learning in the digital era 4.0.	Jurnal Pendidikan Agama Islam
A05	(Fadli, 2021)	The influence of sorogan method in learning history to increase historical understanding and historical awareness	The aim of the study was to examine the influence of the sorogan method in history learning to improve students' historical understanding and awareness.	International Journal of Evaluation and Research in Education
A06	(Farida, 2021)	Women's roles in Iḥyā' 'Ulūm Al-Dīn and Method of teaching it at pesantrens in Indonesia	The aim of the study is to examine the portrayal of women's roles in marriage as presented in the Islamic classical book Iḥyā' 'Ulūm al-Dīn by Abu Hamid al-Ghazali, which is widely taught at Pesantrens in Central Java, Indonesia.	Al Jami'ah
A07	(Ritonga, 2021a)	Strategies for developing tarkib arabic exercises instruments for strengthening the understanding of yellow book	The aim of the study is to analyze Arabic language training models from the perspective of tarkib aspects, focusing on enhancing educators' understanding and application of effective training methods in Arabic education.	International Journal of Entrepreneurship

A08	(Ritonga, 2021b)	The management of arabic language and the yellow book curriculum planning at islamic boarding schools in respond to the freedom to learn education system	The aim of the study is to examine the management of Arabic language and the Yellow Book curriculum planning at Islamic boarding schools in response to the freedom to learn education system, focusing on the effectiveness of learning objectives and methods used in teaching these subjects	Journal of Management Information and Decision Sciences
A09	(Rohman, 2022)	Shaping the Santri's Inclusive Attitudes through Learning in Pesantren: A Case Study of Pesantren Al-Anwar Sarang Rembang Indonesia	The aim of the study is to examine the perception that pesantren (Islamic boarding schools) are breeding grounds for extremism and radicalism, and to demonstrate that they can be institutions that are open, inclusive, and accommodating to modernity.	Journal of Educational and Social Research
A10	(Budiharso, 2023)	Transformation of Education System of the Pesantren in Indonesia from the Dutch Colony to Democratic Era	The aim of the study is to explore the transformations within the Islamic Boarding School (Pesantren) education system over time and their implications for the learning methods employed by students.	Journal of Social Studies Education Research
A11	(Hasan, 2023)	Sufism and Religious Moderation: The Internalization Process in Thoriqoh Syadziliyah Al Masudiyah Jombang	The aim of the study is to explore the internalization of Sufism values in forming an attitude of religious moderation within the Thoriqoh Syadziliyah Al Masudiyah Jombang Congregation.	Nazhruna Jurnal Pendidikan Islam
A12	(Hasbunallah, 2023)	Studying the Kitab of Nashoihul Ibad in Improving the Practice of Prayer in Islamic Boarding Schools	The aim of the study is to explore how the material for reciting the Nashoihul Ibad book can increase the practice of prayer in the community of Parasgowang Hamlet.	Munaddhomah
A13	(Rosyidin, 2023)	The Absorption of Islamic Education Thought of KH. M. Hasyim Asy'ari through Teaching of Adab al-'Alim wa al-Muta'allim among the Santri at the Pesantren Tebuireng	The aim of the study is to systematically document, illustrate, and comprehend the cognitive absorption process of educational concepts in the book "Adab al-'Alim wa al-Muta'allim," authored by K. H. M. Hasyim Asy'ari, among the students of Pesantren Tebuireng Jombang, Indonesia	Millah Journal of Religious Studies

A14	(Hanani, 2024)	AN ECLECTIC APPROACH TO ARABIC LANGUAGE EDUCATION: IMPLEMENTING KITAB AL-AMTSILAH AT-TASHRIFIYAH IN MODERN INDONESIAN PESANTRENS	The aim of the study is to explore the efficacy of eclectic learning methods in enhancing Arabic language mastery among students in Islamic boarding schools, specifically through the use of the al-Amsilah at-Taşrifiyyah book.	Jurnal Pendidikan Islam
A15	(Madkur, 2024)	Context-responsive pedagogy in English language teaching in Indonesian Islamic boarding schools	The aim of the study was to explore the application of context-responsive pedagogy in English language teaching (ELT) within the unique context of Islamic boarding schools in Indonesia, focusing on how teachers navigate their practices with sociocultural and religious values.	Journal of Education and Learning
A16	(Nasution, 2024)	Learning Arabic Language Sciences Based on Technology in Traditional Islamic Boarding Schools in Indonesia	The aim of the study is to analyze traditional Islamic boarding school leaders' perceptions of technology, models of learning Arabic sciences, forms of using technology in learning, and foundation support for using technology in traditional Islamic boarding schools.	Nazhruna Jurnal Pendidikan Islam
A17	(Ayubi, 2025)	Ritual learning method for mystical ijazah at pondok pesantren salafiyah	The aim of the study is to explore the teaching, understanding, practice, and rituals of mysticism among kiai and santri in salafi Islamic boarding schools.	Journal of Education and Learning
A18	(Hanif, 2025)	Arabic Grammar in Minangkabau Surau: Philological Perspectives on Traditional Islamic Education	The aim of the study is to uncover the reasons for the presence of Nahwu manuscripts in nearly every surau in Minangkabau and to explore how Nahwu, a branch of Arabic grammar, was taught in these traditional Islamic educational institutions.	Nazhruna Jurnal Pendidikan Islam
A19	(Ibtihajuddin, 2025)	Reconstructing Islamic Legal Epistemology: The Performative Logic of Ijtihād Irshādī in the Lajnah Bahtsul Masā'il of Pesantren Lirboyo	The aim of the study is to examine the epistemological and performative construction of Ijtihād irshādī at the Lajnah Bahtsul Masail (LBM) of Pesantren Lirboyo, repositioning fatwa as ethical discourse shaped through communicative and socially embedded reasoning.	Justicia Islamica

A20	(Millie, 2025)	Talaqqi in the age of bureaucracy; Symbiosis of pedagogical cultures in West Javanese pesantren	The aim of the study is to investigate the effects of the bureaucratization of Islamic education on the pedagogical forms and styles established within the pesantren, particularly focusing on the face-to-face learning method known as talaqqi.	Wacana
A21	(Radino, 2025)	Critical Pedagogy and Dialogic Learning in Classical Islamic Boarding Schools: An Analysis of Discussion Practices in Madrasah Diniyyah Al-Munawwir Krapyak	The aim of the study is to explore how discussion-based learning practices (musyawarah) in classical Islamic educational institutions reflect the principles of critical pedagogy and dialogical learning.	Jurnal Pendidikan Agama Islam
A22	(Sabaruddin, 2025)	Integrating Social Intelligence Into Character-Based Education: A Contextual Learning Model in Modern Boarding Schools	The aim of the study is to design and evaluate a social intelligence-based learning model for social studies in modern Islamic boarding schools (pesantren) in Indonesia, addressing the lack of social-emotional integration in faith-based curricula.	Emerging Science Journal
A23	(Maslani, 2026)	The Hermeneutic Interpretation of Ta'lim Mutaallim By Al-Zarnuji In Shaping The Morals of Santri at Pesantren	The aim of the study is to understand how the moral teachings in Ta'lim al-Muta'allim by Al-Zarnuji are internalized and dynamically interpreted by educational actors within the pesantren context, moving beyond normative teachings to explore lived moral pedagogy.	Nazhruna Jurnal Pendidikan Islam
A24	(Najib, 2026)	Curriculum Management and Power Relations: Strategies for Multicultural Character Development of Santri in Traditional Pesantren	The aim of the study is to analyze how curriculum is managed and enacted in a traditional pesantren, focusing on the mechanisms that regulate knowledge, power relations, and the formation of santri character.	Munaddhomah

(Source: Processed by Author, 2026)

The data representation compiled in the extraction table above provides an in-depth review of the 24 selected studies that form the empirical basis of this systematic review. The mapping of this information is structured to cover the essential attributes of each piece of literature, ranging from bibliographic identity represented by article codes, author names, and publication chronology, to the theoretical substance embodied in the title and specific research objectives. Furthermore, this table also documents the unique context of each study, enabling comparative analysis of how various operational variables are applied in different environments or backgrounds. The integration of these parameters aims to facilitate holistic data readability, thereby simplifying the identification of conceptual patterns and methodological diversity that emerge from the analyzed literature corpus.

3.2 Methodological and Bibliometric Evolution

A review of the methodological dimensions of the research as visualized in Figure 2 shows a dominant trend in the selection of research designs, with the majority of the literature reviewed showing a strong preference for qualitative approaches. The data shows that more than 90 percent of the articles included in this review adopted qualitative methodologies to explore phenomena in depth and contextually. In contrast, a much smaller portion was represented by the use of quantitative and mixed methods. The dominance of the qualitative approach indicates that the academic discourse on this topic still places great emphasis on the exploration of meaning, the description of subjective experiences, and a comprehensive understanding of social reality in the field, rather than on statistical generalization or the numerical measurement of variables.

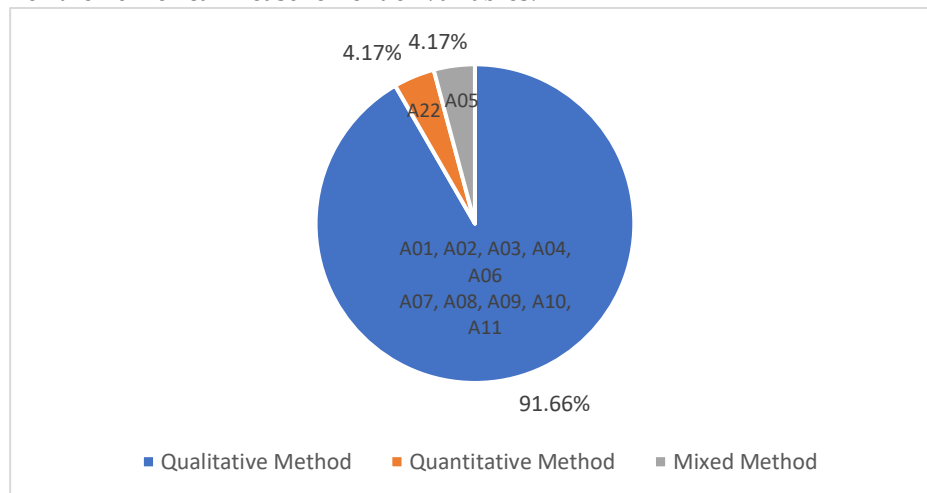


Figure 2. Research Methodologies in The Reviewed Studies

The methodological discourse within the reviewed literature (A01–A24) predominantly adopts qualitative frameworks, utilizing in-depth interviews and participatory observations to examine pesantren pedagogy as a strongly context-dependent and lived educational experience. This phenomenological orientation suggests that the spiritual and social intricacies of Islamic boarding schools transcend mere cognitive transfer, requiring an immersive internalization of values that numerical data may not fully capture. Consequently, important dimensions of learning in this context can be explored through the visceral, dialectical interaction between the Kiai and santri, necessitating the researcher's presence to document subjective realities. However, this qualitative dominance does not preclude methodological diversity, as evidenced by the contrast between articles A21 and A22; while A22 employs a quantitative validation questionnaire to provide objective standardization and numerical generalization of social competencies, A21 leverages qualitative dialogical inquiry to explore nuanced character transformations invisible to standardized metrics. Ultimately, these paradigms function as complementary lenses where the precision of quantitative success indicators and the narrative richness of qualitative inquiry coalesce. This synergy provides a comprehensive mapping of pesantren learning outcomes, effectively encapsulating both objectively measurable performance and the transformative, spiritual processes that define the institution's pedagogical core.

Table 2. Data Collection Techniques for Each Article

Article Code	Data Collection Techniques
A01	observation, interviews, and documentation
A02	interviews, observations, and documentation
A03	observation, documentation, and focus group discussions (FGD), and interview
A04	observation, interviews, documentation, and literature review

A05	observation, interviews, and tests (pre-test and post-test)
A06	documentation, interviews, and observation
A07	Observation, focus group discussions (FGD), and documentation.
A08	observation, interviews, documentation and focus group discussions
A09	interviews and documentation
A10	interviews and observations
A11	interviews, observation, and documentation
A12	including interviews, observation, and documentation
A13	interviews, observations, documentation, and a snowball sampling
A14	unstructured interviews, direct observation, and documentation
A15	observation and semi-structured interviews
A16	interviews, observations, and Documentation
A17	interviews and observations
A18	observation, interviews and documentation
A19	Interviews
A20	Not specific
A21	interviews, observation, and documentation
A22	interviews, observations, documentation, and focus group discussions (FGDs) (Qualitative) Additionally, a validated 25-item Social Skills Questionnaire (Quantitative)
A23	observation, interviews
A24	observation, semi-structured interviews, and document analysis.

(Source: Processed by Author, 2026)

3.3 Deep Learning Distribution of Learning Methods in Islamic Boarding Schools

The thematic coding identified Meaningful Learning in all 24 studies, Joyful Learning in 20 studies, and Mindful Learning in 19 studies (Figure 3). These frequencies represent overlapping codes rather than mutually exclusive study groups. Meaningful Learning was the most pervasive category because the reviewed studies consistently connected learning content with contextual understanding, practical application, ethical formation, or the interpretation of classical knowledge. Joyful Learning was coded where the evidence emphasized dialogic, participatory, affective, or socially supportive interaction, while Mindful Learning was coded where reflective awareness, spiritual discipline, attentional presence, self-regulation, or adab was sufficiently explicit. The article-level coding decisions and their indicators are detailed in Table 3.

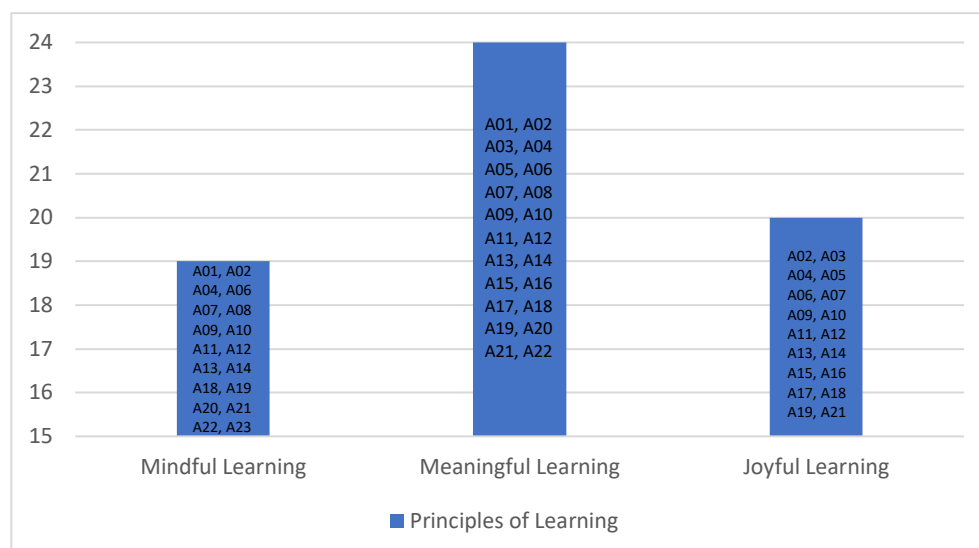


Figure 3. Deep Learning Distribution of The Reviewed Studies

Table 3. Article-Level Coding Matrix for Mindful, Meaningful, and Joyful Learning

Code	Mindful	Meaningful	Joyful	Indicator(s) / Coding basis
A01	Yes	Yes	-	Adaptation, adjustment, self-regulation. Mindful through reflective adaptation; Meaningful through contextual adjustment; Joyful not sufficiently explicit.
A02	Yes	Yes	Yes	Active communication, language mastery, interactive practice. Mindful attention and Meaningful language use; Joyful through active communicative interaction.
A03	-	Yes	Yes	Anti-radicalism, value-oriented teaching, social interaction. Meaningful through ethical-social relevance; Joyful through interactive learning; explicit mindfulness not sufficiently reported.
A04	Yes	Yes	Yes	Digital-era skills, e-learning, educational management. Mindful through adaptive orientation; Meaningful through skill relevance; Joyful through technology-enabled engagement.
A05	-	Yes	Yes	Sorogan, historical understanding, historical awareness. Meaningful cognitive-contextual understanding and Joyful individualized interaction; Mindful was not coded separately from historical awareness.
A06	Yes	Yes	Yes	Classical text, gender roles, interpretive teaching. Mindful ethical reflection; Meaningful contextual interpretation; Joyful through relational teaching and learning.

Code	Mindful	Meaningful	Joyful	Indicator(s) / Coding basis
A07	Yes	Yes	Yes	Tarkib exercises, grammar understanding, training practice. Mindful focused practice; Meaningful conceptual mastery; Joyful through exercise-based participation.
A08	Yes	Yes	-	Curriculum planning, learning objectives, Yellow Book. Mindful through deliberate curricular orientation; Meaningful through relevance and objectives; Joyful not explicit in the management-centered focus.
A09	Yes	Yes	Yes	Inclusive attitudes, openness, accommodation of modernity. Mindful ethical awareness; Meaningful social relevance; Joyful through inclusive interaction.
A10	Yes	Yes	Yes	Transformation, adaptation of learning methods. Mindful adaptive reflection; Meaningful sociohistorical contextualization; Joyful through flexible learning practices.
A11	Yes	Yes	Yes	Sufism, internalization, religious moderation. Mindful spiritual awareness; Meaningful value internalization; Joyful through communal spiritual engagement.
A12	Yes	Yes	Yes	Nashoihul Ibad, prayer practice, devotional learning. Mindful devotional awareness; Meaningful application to practice; Joyful through community-based learning.
A13	Yes	Yes	Yes	Adab, cognitive absorption, teacher-text-student relation. Mindful ethical self-formation; Meaningful cognitive internalization; Joyful through relational transmission.
A14	Yes	Yes	Yes	Eclectic Arabic method, language mastery, varied practice. Mindful focused learning; Meaningful conceptual mastery; Joyful through method variety and active practice.
A15	-	Yes	Yes	Context-responsive ELT, sociocultural and religious adaptation. Meaningful through contextual relevance; Joyful through responsive pedagogy; Mindful not sufficiently explicit for coding.
A16	-	Yes	Yes	Technology-supported Arabic learning and access. Meaningful through application and access; Joyful through technology-mediated engagement; Mindful not sufficiently explicit.
A17	-	Yes	Yes	Mystical ijazah, ritual learning, kiai-santri practice. Meaningful through ritual understanding; Joyful through affective/communal engagement; Mindful not coded separately from rituality.

Code	Mindful	Meaningful	Joyful	Indicator(s) / Coding basis
A18	Yes	Yes	Yes	Nahwu manuscripts, disciplined traditional transmission. Mindful through disciplined study; Meaningful through historical-linguistic context; Joyful through relational transmission.
A19	Yes	Yes	Yes	Ijtihad irshadi, ethical discourse, communicative reasoning. Mindful ethical deliberation; Meaningful socially embedded reasoning; Joyful through communicative participation.
A20	Yes	Yes	-	Talaqqi, face-to-face presence, bureaucratization. Mindful through pedagogical presence; Meaningful through direct transmission; Joyful not coded because bureaucratization constrains affective interaction.
A21	Yes	Yes	Yes	Musyawah, critical pedagogy, dialogic learning. Mindful reflective dialogue; Meaningful critical reasoning; Joyful participatory discussion.
A22	Yes	Yes	Yes	Social intelligence, character education, social-emotional learning. Mindful self/social awareness; Meaningful contextual character formation; Joyful social-emotional engagement.
A23	Yes	Yes	Yes	Ta'lim al-Muta'allim, moral internalization, lived interpretation. Mindful moral reflection; Meaningful lived hermeneutics; Joyful relational/affective internalization.
A24	Yes	Yes	-	Curriculum management, power relations, character formation. Mindful reflexivity concerning knowledge/power; Meaningful character-context linkage; Joyful not sufficiently explicit.

(Source: Author's thematic coding of the 24 included studies, 2026)

The pedagogical architecture of the Pesantren system redefines deep learning by intertwining conceptual depth with transcendental orientation. Analysis of the literature (A01–A24) suggests that the "meaningful learning" pillar in this context extends beyond modern cognitivist frameworks, which typically focus on linking new data to prior knowledge. Instead, through traditional methods like sorogan and bandongan, the dialectical engagement between kiai (teacher) and santri (student) serves as a hermeneutic journey to decode classical texts. Mastery of linguistic tools like nahwu-sharaf is not merely an instructional goal but a spiritualized intellectual process. This ensures that every unit of knowledge is anchored in divine values and social ethics, ultimately transforming the student's character and existential consciousness through a pursuit of sacred wisdom.

Furthermore, the "mindful" and "joyful" dimensions of this ecosystem operate through a unique spiritual-affective lens that distinguishes them from secular educational models. Mindfulness in the pesantren is rooted in muraqabah (divine awareness) and adab (ethical conduct), where cognitive focus is treated as a spiritual discipline rather than a mere stress-reduction tool. However, the manifestation of "joyful learning" appears more contingent upon the nature of the interaction; it flourishes in fluid, communicative contexts such as linguistic and historical studies where self-expression is prioritized. In

contrast, emerging evidence indicates that rigid managerial structures and bureaucratic standardization (A08, A24) often stifle this emotional well-being. Consequently, a reorientation toward inclusive, affect-sensitive management is essential to ensure that the joy of learning remains a holistic component of the santri's educational experience.

3.4 Critical Synthesis and Architectural Construction: Re-envisioning Deep Learning within the Pesantren's Pedagogical Tradition

The implementation of the "Deep Learning" policy in 2025 can be interpreted as partially formalizing pedagogical principles that have long been visible in pesantren traditions. Studies on ritual learning methods in mystical certificates (A17) and the transmission of Nahwu manuscripts in Minangkabau surau (A18) illustrate that emotional and spiritual involvement can form important components of traditional pedagogy. In this context, depth of learning is not limited to cognitive attainment; it may also involve relationships among the learner, sacred texts, and spiritual guidance. The reviewed literature therefore points to a locally rooted configuration of deep learning that predates the recent national policy terminology, without implying that one pedagogical tradition is universally superior to another.

However, the emergence of this policy on the national stage also invites critical reflection on the extent to which local pedagogical traditions have been recognized in formal policy discourse. The long continuity of pesantren education suggests that indigenous educational practices may provide relevant empirical and conceptual resources for contemporary reform. Rather than positioning pesantren as merely an object of policy, the findings support considering it as one important source of reference alongside other pedagogical traditions. In this sense, Indonesian educational reform may benefit from combining internationally developed frameworks with locally grounded practices whose relevance is supported by the reviewed evidence.

The synthesis offered by this study, with reference to the distribution of the three pillars of deep learning in the pesantren learning method, presents an important theoretical finding that the author defines as the "Golden Triangle of Pesantren Deep Learning Architecture." This triangular narrative was chosen because it reflects the triadic interdependence between the three main pillars, where failure on one side will undermine the overall pedagogical integrity.

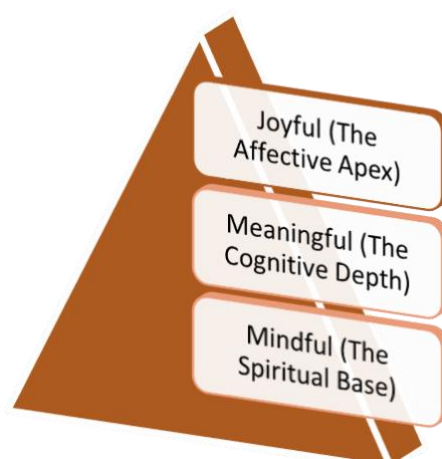


Figure 4. The Golden Triangle of Deep Learning Architecture in Pesantren

1. **Mindfulness as the Foundation (The Spiritual Base):** In this model, Mindfulness is positioned as the base of the triangle. Without full presence and sincere intention (as found in studies A11 and A13), the cognitive process of santri will not have a stable "container." The narrative in Figure 4 shows that transcendental awareness (Muraqabah) is a prerequisite that enables santri to enter a more intense phase of learning.
2. **Meaningful as the Vertical Axis (Cognitive Depth):** The line connecting the base of the triangle to the peak represents Meaningful learning. This is an intellectual climbing process in which students contextualize classical Islamic texts (studies A07, A14). If Mindful is inner readiness, then Meaningful is the construction of knowledge carried out by students. The distribution map in Figure 4 is consistent with the interpretation that this pillar receives the broadest representation across the reviewed studies.
3. **Joyful as the Apex and Atmosphere (The Affective Apex):** Joyful is positioned at the apex of the triangle and also as the atmosphere that envelops the entire process. The narrative from Figure 4 explains that the joy of learning (Barakah) is not merely the end result, but rather the energy that ensures this triangle remains intact. When students find meaning (Meaningful) from deep awareness (Mindful), then "Flow" or intellectual joy emerges (as seen in the pattern of communicative interaction in study A02).

Through this visualization, the study proposes that pesantren education represents a distinct, spiritually grounded configuration of mindfulness rather than a universally superior alternative to secular frameworks. In the "Golden Triangle," the three pillars are interpreted as interacting rather than operating in a strictly linear sequence. The absence of an explicit Joyful code in several management- or bureaucracy-oriented studies (including A08, A20, and A24) suggests that institutional structures may constrain affective engagement or pedagogical intimacy. This pattern should be interpreted as a thematic signal from the reviewed literature rather than as evidence of inevitable psychological outcomes.

In the world of Islamic boarding schools, the practice of deep learning also carries several risks. For example, in the transformation of Pesantren pedagogy, there is a phenomenon of "bureaucratization of education" that tends to erode the depth of instruction. As discussed by Millie (A20), the establishment of overly rigid administrative standards risks converting educators' energy from pedagogical activities to bureaucratic procedural tasks. In the pesantren tradition, learning success is highly dependent on the talaqqi method—an intimate and personal interaction between the kiai and santri that requires total inner presence. If a teacher is trapped in extensive administrative reporting requirements, the conditions that support mindful pedagogical presence may be weakened. A reduction in this "full

presence" may affect both knowledge transmission and the relational processes through which spiritual and character-oriented values are conveyed.

On the other hand, the integration of digital technology, which is portrayed as an accelerator of learning (A16), may also introduce distractions that complicate meaningful learning. Although digitization expands access to learning resources (A04), the reviewed literature suggests the importance of preserving conditions for sustained attention, reflection, and contextual engagement. Unregulated gadget use may reduce opportunities for theological contemplation and close reading of classical texts; however, this review does not establish a deterministic effect of technology on learning depth. The synthesis therefore indicates that digital integration in pesantren should be accompanied by pedagogical arrangements that protect reflective study and sustained focus. Future deep-learning design may benefit from balancing digital tools with learning conditions that support the discovery of contextual and transcendental meaning.

As a strategic implication, pesantren could be positioned not only as institutions that respond to national policy but also as contributors to the ongoing development of character-oriented pedagogy. Across the reviewed studies, cognitive and spiritual dimensions repeatedly appear together in descriptions of learning practices. This pattern supports the interpretation that, within the pesantren contexts represented in the evidence base, cognitive engagement and spiritual engagement are closely related dimensions of the learning experience rather than independent or competing processes.

As national policy increasingly emphasizes deep learning, pesantren offer examples in which knowledge is approached through both intellectual understanding and value internalization. These examples may provide useful comparative insights for broader educational discussions, particularly where reform seeks to balance reasoning, ethical formation, and spiritual or affective development. The findings do not establish a single universal pathway, but they indicate that intellectual integrity may be strengthened when learning environments provide space for both cognitive and spiritual development.

4. CONCLUSION

This study concludes that the pedagogical ecosystem of Islamic boarding schools in Indonesia appears to have incorporated elements of *deep learning* long before the formalization of the 2025 national education policy. Through a systematic literature review of 24 selected studies, it was found that the pillars of *mindfulness*, *meaning*, and *joy* were represented not only as theoretical concepts but also through practices described in traditional methods such as *sorogan*, *bandongan*, and *talaqqi*. The synthesis suggests that spirituality frequently functions as an important context for cognitive attention and for connecting classical knowledge with the lived, ethical, and transcendental concerns of learners.

Theoretically, this study constructs a new architecture called the "Golden Triangle of Deep Learning Pesantren." This model proposes that deep *cognitive engagement* may be strengthened when accompanied by *spiritual engagement* as the basis for *mindfulness* and a *joyful* atmosphere based on the concept of *barakah*. This interpretive model contributes to educational discourse by offering a context-specific extension to mainstream *mindfulness* frameworks, particularly by foregrounding spiritual engagement within the learning process. The reviewed studies indicate that the integration of intellectual depth and spiritual orientation may be relevant to character formation and moral stability amid technological disruption and global complexity.

As a policy implication, this article emphasizes that the transformation of Indonesia's national education should not ignore long-standing local pedagogical wisdom. Criticism of the challenges of bureaucratization and digital distractions requires policymakers to be more selective in applying standardization so as not to stifle emotional and spiritual closeness in the learning process. This study recommends that the pesantren model be considered as one relevant reference in the development of character-based curricula, in which education is no longer seen as merely a transfer of information, but as a holistic effort to produce a generation with sharp reasoning skills and strong spiritual maturity.

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