

Implementing Deep Learning in Islamic Religious Education: Evidence from Indonesian Schools under the Merdeka Curriculum

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Abstract

The implementation of Deep Learning within Indonesia's Merdeka Curriculum has emerged as an important strategy for transforming teaching and learning. However, its application in Islamic Religious Education (IRE) at the elementary school level, particularly when integrated with school culture, remains underexplored. This study aims to analyze the implementation of the Deep Learning approach in IRE at SD Negeri 01 Sawahan, Padang City, focusing on: (1) the application of the principles of mindful learning, meaningful learning, and joyful learning; (2) implementation challenges; and (3) learning evaluation strategies. A qualitative case study design was employed. Data were collected through classroom observations, semi-structured interviews, and document analysis involving 13 purposively selected participants, consisting of one principal, two IRE teachers, and ten students. Data were analyzed using the interactive model developed by Miles, Huberman, and Saldaña. The findings indicate that the Deep Learning approach was implemented through collaborative group discussions, project-based learning, the use of digital learning media, and reflective learning activities. Its implementation was supported by the principles of mindful, meaningful, and joyful learning, although several challenges remained, including limited educational resources, diverse student characteristics, and the need to strengthen teachers' pedagogical competencies. The study also found that integrating the Deep Learning approach with the school's religious culture through the barcode-based Smart Surau program extended students' learning experiences beyond the classroom by fostering regular religious practices and authentic assessment, thereby reinforcing the internalization of Islamic values. These findings provide empirical evidence that the successful implementation of Deep Learning in IRE depends not only on classroom instructional strategies but also on a supportive school culture that functions as a pedagogical ecosystem for promoting meaningful learning experiences.

Keyword: *Deep Learning; Merdeka Curriculum; Islamic Religious Education; School Culture; Smart Surau*

A. Introduction

Education is a systematic process aimed at developing students' potential holistically across cognitive, affective, and psychomotor domains while fostering learners' intellectual, moral, social, and spiritual development (Fullan et al., 2020; Kafa Aula et al., 2025). Indonesia's National Education System Law No. 20 of 2003 states that education functions to develop learners' capabilities while fostering the character and civilization of a dignified nation (Indonesia, 2003). Achieving these objectives requires a curriculum that is responsive to advances in science and technology as well as to the evolving needs of society (Izati & Fadri, 2025).

The Merdeka Curriculum was introduced as part of Indonesia's educational transformation, providing schools and teachers with greater flexibility to design learning experiences that accommodate students' diverse characteristics and learning needs (Nuzuli, 2025; Rahmadayanti & Hartoyo, 2022). The curriculum emphasizes competency-based learning, differentiated instruction, and character development through the Pancasila Student Profile (Hikmah et al., 2024; Rahmadayanti & Hartoyo, 2022). In line with these objectives, the Deep Learning approach has emerged as a pedagogical paradigm that supports the effective implementation of the Merdeka Curriculum by promoting learning experiences that are meaningful, reflective, collaborative, and relevant to students' real-life contexts (Fullan et al., 2020; Saniah et al., 2024).

According to Fullan, Quinn, and McEachen (2020), Deep Learning enables students to construct knowledge through authentic learning experiences, collaboration, reflection, and problem-solving, thereby fostering the development of the six global competencies (6Cs): character, citizenship, collaboration, communication, creativity, and critical thinking. More recently, the Indonesian government has encouraged the implementation of the Deep Learning approach by emphasizing three core learning principles: mindful learning, meaningful learning, and joyful learning as the foundation for creating active, student-centered, and transformative learning environments (Syauqi & Wahidin, 2025).

In the context of Islamic Religious Education (IRE), this approach is particularly relevant because IRE aims not only to develop students' cognitive competencies but also to cultivate Islamic values that are reflected in their attitudes and daily behaviors through the integration of knowledge, character formation, and religious practice (Fahmi et al., 2025; Izati & Fadri, 2025). Through mindful, meaningful, and joyful learning, students are expected to internalize and apply Islamic values in authentic real-life contexts by connecting classroom

learning with their daily religious experiences and social interactions (Fullan et al., 2020).

Previous studies have shown that the implementation of the Merdeka Curriculum provides teachers with greater flexibility to design student-centered learning and adapt instructional strategies to accommodate diverse learning needs (Hikmah et al., 2024; Rahmadayanti & Hartoyo, 2022). Its successful implementation is also influenced by teachers' pedagogical competence, access to professional development, and schools' readiness to establish adaptive learning environments (Saniah et al., 2024). Nevertheless, the implementation of the Merdeka Curriculum in Indonesian elementary schools continues to face various challenges, limiting its effectiveness in achieving the intended educational objectives (Hikmah et al., 2024; Nuzuli, 2025).

Although previous studies have examined the implementation of the Merdeka Curriculum and instructional strategies in Islamic Religious Education (IRE), most have focused primarily on curriculum flexibility, the development of instructional materials, and teachers' pedagogical competencies. Limited attention has been given to how the core principles of the Deep Learning approach—mindful learning, meaningful learning, and joyful learning—are enacted in IRE classrooms at the elementary school level within an integrated pedagogical ecosystem that combines instructional practices with students' religious experiences (Fullan et al., 2020). Furthermore, the ways in which a school's religious culture interacts with classroom instructional strategies to facilitate the internalization of Islamic values and promote meaningful learning experiences remain insufficiently explored, particularly in the context of public elementary schools implementing the Merdeka Curriculum.

Addressing this research gap is important because a deeper understanding of the relationship between the Deep Learning approach and school religious culture can contribute to both conceptual knowledge and practical insights for designing more meaningful and contextually relevant IRE learning in elementary schools by integrating instructional processes with students' religious experiences and school culture (Fullan et al., 2020; Kafa Aula et al., 2025).

Accordingly, this study extends the existing literature by examining not only how the Deep Learning approach is implemented in Islamic Religious Education but also how a school's religious culture functions as a pedagogical ecosystem that supports the enactment of mindful, meaningful, and joyful learning. Unlike previous studies that primarily focused on curriculum

implementation or instructional strategies, this study highlights the interaction between classroom pedagogy and religious school culture as an integrated learning ecosystem. By investigating the barcode-based Smart Surau program, this study demonstrates how classroom instructional strategies, habitual religious practices, and authentic assessment are integrated to facilitate the internalization of Islamic values and enrich students' learning experiences.

From a theoretical perspective, this study contributes to the Deep Learning literature by positioning a school's religious culture as an integral component of the pedagogical ecosystem that supports the learning process. The findings suggest that the implementation of the Deep Learning approach is facilitated not only by classroom instructional strategies but also by habitual religious practices that promote reflection, meaningful learning experiences, and the internalization of Islamic values. This study further argues that sustainable Deep Learning is shaped through the interaction between instructional design, school culture, and authentic religious practices that continuously reinforce students' character development. These findings extend the understanding that the successful implementation of Deep Learning depends not only on instructional design but also on the broader school culture that continuously shapes students' learning experiences.

Based on this rationale, the present study aims to analyze the implementation of the Deep Learning approach in Islamic Religious Education (IRE) within the Merdeka Curriculum at SD Negeri 01 Sawahan, Padang City. Specifically, it examines: (1) the implementation of learning activities based on the principles of mindful, meaningful, and joyful learning; (2) the challenges encountered during implementation; and (3) the evaluation strategies employed by teachers.

B. Method

This study employed a qualitative approach using a case study design to obtain an in-depth understanding of a contemporary educational phenomenon within its real-life context (Creswell & Poth, 2018; Yin, 2018). A qualitative case study was considered appropriate because it enables an in-depth exploration of the implementation of the Deep Learning approach in Islamic Religious Education (IRE) within the Merdeka Curriculum at the elementary school level.

The study was conducted at SD Negeri 01 Sawahan, Padang City, West Sumatra, Indonesia, from October to December 2025. The research site was selected purposively based on three considerations: (1) the school had fully

implemented the Merdeka Curriculum; (2) it had begun integrating the principles of the Deep Learning approach into IRE instruction; and (3) it had established the Smart Surau religious culture program, which was directly relevant to the focus of this study.

The participants consisted of one principal, two IRE teachers, and ten students from Grades IV and V, resulting in a total of 13 participants. Participants were selected through purposive sampling to ensure that each participant possessed direct experience and sufficient knowledge relevant to the research focus (Creswell & Poth, 2018; Moleong, 2021).

Data were collected using three techniques: classroom observations, semi-structured interviews, and document analysis. Classroom observations were conducted in a non-participant role over ten learning sessions in Grades IV and V. An observation protocol was developed based on indicators of the Deep Learning approach. The observations focused on teachers' instructional practices, students' engagement, the implementation of the principles of mindful, meaningful, and joyful learning, the use of learning media, teacher-student interactions, reflective learning activities, and the integration of the school's religious culture through the Smart Surau program.

Table 1

Observation Indicators for the Implementation of the Deep Learning Approach in Islamic Religious Education

Aspect	Observation Indicators
Mindful Learning	Students demonstrate attention, concentration, and active engagement throughout the learning process.
Meaningful Learning	Students relate the learning content to their prior knowledge, personal experiences, or real-life situations.
Joyful Learning	The learning environment is active, enjoyable, interactive, and collaborative.
Instructional Strategies	Teachers employ group discussions, project-based learning, reflective activities, and digital learning media.
Authentic Assessment	Teachers implement process-based assessment, performance assessment, and students' reflective assessment.
Smart Surau Integration	Teachers integrate classroom instruction with the Smart Surau program and habitual religious practices.

Semi-structured interviews: Semi-structured interviews were conducted face-to-face with the principal, IRE teachers, and students using an interview protocol developed in accordance with the research objectives. The interview protocol covered four main themes: (1) planning learning activities based on the Deep Learning approach; (2) the implementation of the principles of mindful, meaningful, and joyful learning; (3) challenges encountered during the implementation process; and (4) learning evaluation strategies. Each interview lasted approximately 30–60 minutes and was audio-recorded with participants' informed consent. The recordings were subsequently transcribed verbatim to facilitate data analysis.

Document analysis: Documentary data included teaching modules, instructional materials, assessment records, photographs of learning activities, documents related to the *Smart Surau* program, and other relevant school records. These documents were analyzed to complement and triangulate the findings obtained from classroom observations and semi-structured interviews.

Trustworthiness of the data: The trustworthiness of the data was established through source triangulation, method triangulation, and member checking (Sugiyono, 2013). Source triangulation involved comparing information obtained from the principal, IRE teachers, and students. Method triangulation was conducted by comparing findings derived from classroom observations, semi-structured interviews, and document analysis. In addition, member checking was carried out by returning the preliminary findings to selected participants to verify the accuracy of the researchers' interpretations and ensure that the findings accurately reflected the participants' perspectives.

Data analysis: Data were analyzed using the interactive model proposed by Miles, Huberman, and Saldaña, which consists of three interrelated stages: data condensation, data display, and conclusion drawing and verification (Miles et al., 2014). The analysis began with the verbatim transcription of all interview recordings and observation field notes. Subsequently, initial coding was conducted to identify meaningful units relevant to the research objectives. Similar codes were then grouped into conceptually related categories. Finally, themes were developed by integrating these categories into overarching patterns that explained the implementation of the Deep Learning approach in Islamic Religious Education. The resulting themes were continuously refined and verified through source triangulation, method triangulation, and member checking to enhance the credibility and trustworthiness of the findings.

C. Results and Discussion

1. Results

This study generated a set of findings that illustrate how the Deep Learning approach was implemented in Islamic Religious Education (IRE) at SD Negeri 01 Sawahan, Padang City. The findings were derived from classroom observations, semi-structured interviews with participants, and document analysis. For clarity of presentation, the findings are organized into four main themes corresponding to the research objectives, providing a comprehensive understanding of how the Deep Learning approach was enacted within the school's instructional practices.

Implementation of the Deep Learning Approach in Islamic Religious Education (IRE)

The findings from classroom observations and semi-structured interviews indicate that SD Negeri 01 Sawahan has implemented the Merdeka Curriculum by integrating the Deep Learning approach into Islamic Religious Education (IRE). The implementation was evident throughout the instructional process, from the introductory activities to the lesson closure.

During the introductory phase, the teacher used an interactive digital wheel projected onto a screen to review concepts from previous lessons. The random selection of students' names created a dynamic classroom atmosphere and encouraged all students to remain attentive and prepared to participate. In addition, positive reinforcement in the form of applause was provided to acknowledge students' contributions, thereby fostering intrinsic motivation and self-confidence.

During the main learning activities, the teacher employed collaborative group discussions, problem-solving tasks, student presentations, and visual learning resources, including Qur'anic verses, images, and instructional videos. These instructional practices reflected a shift from teacher-centered instruction to student-centered learning. Students were encouraged to construct knowledge through social interaction and authentic learning experiences. As one teacher explained: "I always try to make students actively involved in the learning process. They understand the material better when they engage in discussions and hands-on activities rather than simply listening to lectures." (IRE Teacher, Interview, November 15, 2025)

Classroom observations further indicated that group discussions enhanced students' participation throughout the learning process. Across ten

observation sessions, most students actively expressed their ideas, asked questions within their groups, and presented the outcomes of their discussions to the class. These findings suggest that students did not merely receive information from the teacher; instead, they actively constructed their understanding through interaction, collaboration, and shared learning experiences.

Table 2

Deep Learning-Based Learning Activities in Islamic Religious Education (PAI) at SD Negeri 01 Sawahan

No	Activity	Frequency	Description
1	Group Discussion	8 out of 10 sessions	Predominantly used instructional strategy
2	Student Presentations	7 out of 10 sessions	Students presented the outcomes of group discussions
3	Use of Digital Media	6 out of 10 sessions	Interactive wheel, videos, and images
4	Project-Based Activities (Posters/Calligraphy)	4 out of 10 sessions	Creative project assignments
5	Reflection Sessions	9 out of 10 sessions	Students shared their understanding and learning experiences

Application of Mindful, Meaningful, and Joyful Learning Principles

- 1) **Implementation of the Principle of Mindful Learning:** The principle of mindful learning was reflected in a range of instructional activities designed to help students recognize the purpose and significance of learning from the beginning of each lesson. The teacher greeted students, checked their well-being, and conducted introductory activities that connected previous learning experiences with new content. These practices positioned learning as an intentional and meaningful process rather than a routine classroom activity. They also promoted students' mental readiness and sustained

attention, enabling them to participate not only physically but also cognitively and emotionally throughout the lesson. As one teacher explained:

"Before starting the lesson, I always ask the students how they are doing and what they remember from the previous lesson. This helps them become aware of what they are going to learn and why it is important." (IRE Teacher, Interview, November 15, 2025)

Classroom observations showed that almost all students were able to respond appropriately to the teacher's introductory questions and demonstrated readiness to participate after the lesson was linked to their prior learning experiences.

- 2) **Implementation of the Principle of Meaningful Learning:** The principle of meaningful learning was evident when the teacher connected Islamic Religious Education (IRE) content with authentic real-life situations through contextual examples, value-oriented discussions, and creative learning projects. For example, when teaching moral values (akhlaq) and the Asmaul Husna (the Beautiful Names of Allah), students were encouraged not only to understand the concepts theoretically but also to relate them to their daily behaviors at home and at school. This instructional strategy facilitated the internalization of Islamic values by making learning more relevant and personally meaningful.

Classroom observations further indicated that students were able to explain practical examples of the attributes Ar-Rahman (The Most Compassionate) and Ar-Rahim (The Most Merciful) and relate these concepts to their own experiences in family and school settings. These findings suggest that contextual learning enabled students to connect religious knowledge with everyday practice.

- 3) **Implementation of the Principle of Joyful Learning:** The principle of joyful learning was implemented by creating an engaging and supportive learning environment through the use of an interactive digital wheel, collaborative group discussions, student presentations, simple forms of recognition, and digital learning media. Interviews with students revealed that the use of projectors, visual materials, and collaborative activities increased their motivation and reduced feelings of anxiety during the learning process. One student stated:

"I enjoy learning Islamic Religious Education because the lessons use a projector and interesting pictures. When we work in groups, we can

discuss ideas with our friends." (Grade V Student, Interview, November 20, 2025)

These findings indicate that an enjoyable learning environment promoted active participation while strengthening students' intrinsic motivation. Classroom observations consistently showed a highly interactive learning atmosphere. Students demonstrated enthusiasm when the teacher used the interactive digital wheel and visual learning media, and many voluntarily presented the outcomes of their group discussions to the class.

Challenges in Implementing Deep Learning

The findings indicate that the implementation of the Deep Learning approach in Islamic Religious Education (IRE) at SD Negeri 01 Sawahan, Padang City, has shown encouraging progress. Nevertheless, several challenges continue to affect its effective implementation. These challenges extend beyond classroom instructional practices and are associated with teachers' professional readiness, students' diverse characteristics, as well as limitations related to instructional time and learning resources.

One of the primary challenges concerns the diversity of students' learning characteristics and academic abilities. Classroom observations revealed considerable variation in students' participation during group discussions and presentation activities. While some students actively expressed their ideas and engaged confidently in collaborative learning, others tended to participate less actively and required more intensive guidance from the teacher. These differences required teachers to adopt adaptive instructional strategies to ensure equitable learning opportunities for all students. From the perspective of the Deep Learning approach, such diversity presents a challenge because meaningful learning depends on the active participation of all students in constructing knowledge through interaction and reflection.

Another challenge relates to the limited instructional time available for implementing the Deep Learning approach. Teachers were required to balance the achievement of the intended learning outcomes specified in the Merdeka Curriculum with instructional activities such as collaborative discussions, inquiry, project-based learning, and reflective practices, all of which require more instructional time than conventional teaching approaches. Consequently, opportunities for reflection and conceptual reinforcement could not always be fully incorporated into every lesson. These findings suggest that the successful implementation of the Deep Learning approach requires greater flexibility in

time management so that learning can prioritize conceptual understanding rather than merely completing the prescribed curriculum content.

The study also found that teachers' understanding of the Deep Learning approach remains in a developmental stage. Although teachers had adopted various active learning strategies, including collaborative discussions, project-based learning, and the use of digital learning media, their conceptual understanding of how to systematically integrate the principles of mindful learning, meaningful learning, and joyful learning continued to evolve. This finding indicates that the successful implementation of the Deep Learning approach depends not only on curriculum reform but also on sustained efforts to strengthen teachers' pedagogical competencies through continuous professional development and mentoring.

In addition, the integration of educational technology and instructional resources was constrained by limited facilities. Although projectors, visual media, and interactive digital applications contributed to more engaging learning experiences, not all instructional content could be adequately supported by the available resources. Consequently, teachers were required to demonstrate creativity in developing alternative learning media that could achieve the intended learning objectives despite existing resource constraints.

Despite these challenges, the findings demonstrate that teachers were able to adapt through instructional innovation and by making effective use of the available learning environment. This suggests that the challenges associated with implementing the Deep Learning approach should not be viewed as insurmountable barriers but rather as opportunities to enhance teachers' professional capacity in designing more contextualized and student-centered learning experiences.

Learning Evaluation Strategies Supporting the Implementation of Deep Learning

Learning evaluation constitutes an integral component of the Deep Learning approach, serving not only to assess students' learning outcomes but also to provide feedback on their thinking processes, reflective practices, and character development. The findings of this study indicate that teachers at SD Negeri 01 Sawahan implemented authentic assessment strategies that holistically evaluated students' cognitive, practical, and affective competencies.

Classroom observations revealed that teachers employed a variety of assessment methods beyond conventional written tests. Students' participation

during classroom activities, collaborative discussions, oral presentations, project-based assignments, and reflective learning activities were all incorporated into the assessment process. This comprehensive approach enabled teachers to obtain a more complete understanding of students' learning progress than could be achieved through cognitive assessments alone.

One of the most prominent evaluation strategies was the systematic use of reflective activities at the end of each lesson. Students were encouraged to articulate what they had learned, describe their learning experiences, and explain how Islamic values could be applied in their daily lives. These reflective activities functioned not only as a form of formative assessment but also as a means of facilitating the internalization of Islamic values, thereby making learning more meaningful. From the perspective of the Deep Learning approach, reflection represents a fundamental component that enables students to connect prior experiences with the construction of deeper and more enduring knowledge.

In addition to reflective assessment, teachers implemented project-based assessment through activities such as designing educational posters, producing Islamic calligraphy, and completing projects related to Islamic Religious Education (IRE). These projects provided opportunities for students to demonstrate creativity while applying their conceptual understanding in authentic learning tasks. Consequently, assessment focused not only on learning outcomes but also on the learning process and students' ability to integrate conceptual knowledge with practical skills.

The most significant finding of this study concerns the integration of the Deep Learning approach with the school's religious culture through the Smart Surau program. This program employs a barcode-based digital system to record students' religious activities, including congregational prayers, Qur'an recitation, and other religious practices performed at home or in local mosques. The recorded data are monitored by IRE teachers and incorporated into the assessment of students' spiritual development.

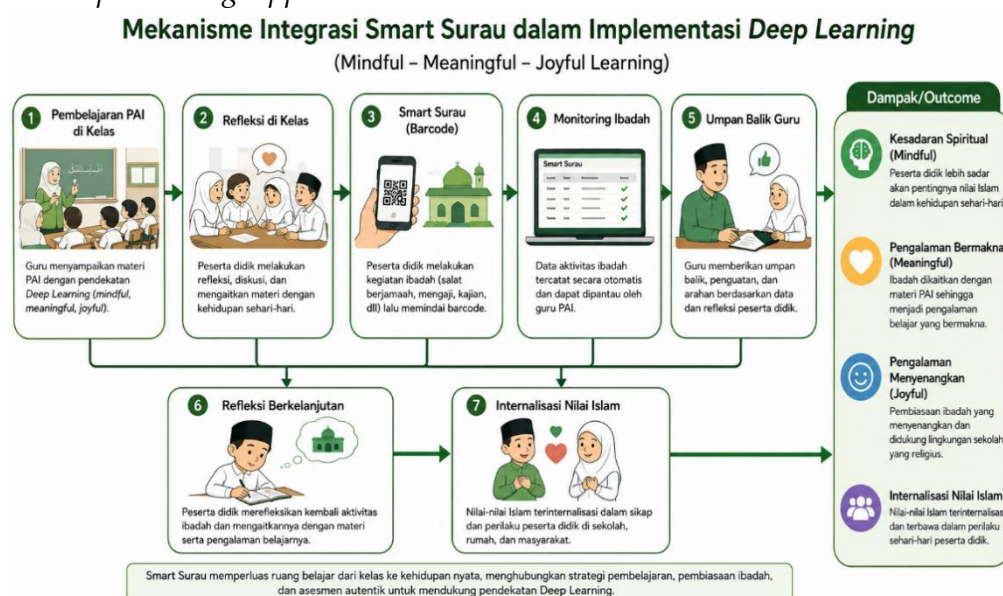
As the principal explained: *"The Smart Surau program allows us to monitor students' religious practices beyond the school environment. Students scan the barcode after completing prayers or Qur'an recitation, and the information is automatically recorded for the IRE teachers."* (Principal, Interview, November 10, 2025)

Similarly, one IRE teacher stated: *"The Smart Surau data are used not only for assessment but also as a basis for classroom reflection. Students become more aware that their religious practices are an integral part of their learning process."* (IRE Teacher, Interview, November 15, 2025)

The Smart Surau program extends learning beyond the classroom into students' everyday lives by connecting formal instruction with habitual religious practice. Classroom observations indicated that students consistently used the barcode system after participating in religious activities. Teachers subsequently incorporated these records into classroom reflection and feedback sessions. Rather than functioning solely as attendance records, the data served as a basis for discussing students' consistency in religious practice and the application of Islamic values in daily life.

Overall, the findings demonstrate that the integration of the Smart Surau program broadened students' learning experiences from the classroom to their family and community environments while encouraging the independent practice of religious activities. Students no longer perceived worship as an activity separate from school learning; instead, they viewed it as a continuous component of their educational experience. These findings suggest that the Smart Surau program functions as a pedagogical bridge between conceptual learning in the classroom and the sustained internalization of Islamic values through authentic religious practice.

Figure 1. *Integration Mechanism of the Smart Surau Program in the Implementation of the Deep Learning Approach*



2. Discussion

Implementation of the Deep Learning Approach in Islamic Religious Education (PAI)

The findings indicate that the implementation of the Deep Learning approach at SD Negeri 01 Sawahan has not only transformed teachers' instructional practices but also reflected a pedagogical shift from a teacher-centered transmissive model to a student-centered constructivist approach. In this context, students are no longer positioned as passive recipients of information but as active participants who construct knowledge through interaction, reflection, and authentic learning experiences. These findings are consistent with the perspective of Fullan et al. (2020), who argue that Deep Learning occurs when students actively construct knowledge through meaningful experiences, collaboration, and authentic problem-solving.

However, the present study extends the conceptual perspective proposed by Fullan et al. (Fullan et al., 2020). While Fullan and colleagues emphasize authentic learning experiences and collaboration as the core elements of the Deep Learning approach, the findings of this study suggest that, within the context of Islamic Religious Education (IRE) at the elementary school level, learning becomes more meaningful when it is closely connected to students' everyday religious practices. Accordingly, the implementation of the Deep Learning approach contributes not only to the development of academic competencies but also to character formation and the internalization of Islamic values through contextual and authentic learning experiences. This finding is in line with recent literature indicating that meaningful Islamic Religious Education should integrate conceptual understanding with authentic learning experiences so that students can internalize religious values in their daily lives (Hasanah & Permana, 2025).

The use of collaborative discussions, project-based learning, and digital learning media enabled students to develop multiple twenty-first-century competencies in an integrated manner, particularly critical thinking, communication, and collaboration. These findings are also consistent with Syamsidar et al. (2025), who reported that the integration of interactive digital media and collaborative learning strategies in Islamic Religious Education enhanced students' participation, confidence, collaboration, and meaningful learning experiences. Through group discussions, students were encouraged to express their ideas, respond to their peers' perspectives, and construct shared understanding through collaborative inquiry. Project-based learning provided

opportunities for students to apply conceptual knowledge to authentic tasks, while digital learning media fostered a more interactive and contextually relevant learning environment. These findings support those of Rahmadayanti and Hartoyo (2022), who argue that the Merdeka Curriculum provides teachers with greater flexibility to design instructional practices that are adaptive, contextualized, and responsive to students' diverse learning needs.

Application of Mindful, Meaningful, and Joyful Learning Principles

This study demonstrates that the three core principles of the Deep Learning approach—mindful learning, meaningful learning, and joyful learning—were not implemented as isolated components but rather functioned as complementary and mutually reinforcing dimensions of a holistic learning experience. Mindful learning fostered students' mental readiness and sustained attention throughout the learning process; meaningful learning enabled students to connect instructional content with their prior experiences and everyday lives; and joyful learning created a positive, supportive, and motivating learning environment. The interaction among these three principles encouraged students' active, reflective, and emotional engagement, thereby extending learning beyond the acquisition of subject knowledge. These findings support the argument of Fullan et al. (2020) that Deep Learning requires the simultaneous integration of cognitive, emotional, and social engagement to produce meaningful and sustainable learning outcomes.

Furthermore, the findings suggest that Deep Learning is not achieved through the application of a single instructional strategy but through the dynamic interaction of cognitive, affective, and social learning processes throughout instruction. In this regard, the three principles operate synergistically: mindful learning establishes students' readiness to learn, meaningful learning facilitates the connection between conceptual understanding and authentic experience, and joyful learning cultivates a classroom climate that encourages active participation. Together, these interconnected principles create the pedagogical conditions necessary for deeper and more enduring learning.

Challenges in Implementing the Deep Learning Approach

The challenges identified in this study—including limited instructional resources and facilities, the diversity of students' characteristics, and teachers' developing capacity to implement the Deep Learning approach—are consistent with the findings of Saniah et al. (2024), who argue that the successful implementation of the Merdeka Curriculum depends largely on teachers' pedagogical competence. These findings suggest that curriculum reform alone is insufficient to transform classroom practices unless it is accompanied by adequate human resource capacity and institutional support. This finding is also supported by Agustini et al. (2025), who argue that sustainable educational reform requires institutional commitment, effective educational governance, and continuous support for teachers' professional development to ensure that curriculum innovation can be implemented consistently across schools.

However, the present study also demonstrates that teachers' creativity in designing learning experiences and the school's commitment to fostering a supportive learning environment can mitigate many of these challenges. Consequently, the implementation of the Deep Learning approach should not be viewed solely as a matter of instructional practice; rather, it depends on the synergy among teachers' professional competence, school culture, and sustained institutional support.

More importantly, these findings indicate that the successful implementation of the Deep Learning approach is influenced not only by teachers' readiness as instructional practitioners but also by the organizational capacity of schools to provide adequate resources, continuous professional development, and a collaborative culture that supports pedagogical innovation. In this regard, effective implementation emerges from the interaction between individual teacher competence and institutional readiness, highlighting that educational innovation is fundamentally a systemic rather than an individual endeavor.

Learning Evaluation Strategies and the Integration of School Culture through the Smart Surau Program

The most significant finding of this study is the integration of the Deep Learning approach with the school's religious culture through the Smart Surau program. This finding reinforces the perspective that Islamic education becomes more meaningful when religious values are embedded within authentic educational practices and continuously integrated into students' daily

experiences rather than being confined to classroom instruction (Rizki et al., 2025). This integration demonstrates that learning extends beyond classroom instruction into students' social environments through the habitual practice of religious values in everyday life. As a result, learning experiences become more contextual, continuous, and meaningful for students' character development. These findings are consistent with the perspective of Fullan et al. (2020), who argue that Deep Learning occurs when learners connect acquired knowledge with authentic actions in real-life contexts, enabling knowledge to be transformed from conceptual understanding into meaningful practice.

The findings further suggest that the Smart Surau program contributes to the implementation of the Deep Learning approach through three interrelated mechanisms. First, it extends the learning environment beyond the classroom to include students' families and communities, allowing learning to continue after formal instructional activities have ended. Second, the barcode-based recording system enables teachers to monitor students' religious practices continuously and to provide more authentic feedback on their spiritual development. Third, the consistent practice of religious activities encourages students to reflect on the relationship between classroom learning and their lived experiences. Through these mechanisms, the Smart Surau program functions not merely as a tool for cultivating religious habits but as a pedagogical bridge that connects conceptual learning with authentic experience, thereby strengthening the internalization of Islamic values.

Collectively, these findings extend the existing Deep Learning literature by demonstrating that, within the context of Islamic Religious Education at the elementary school level, meaningful learning is shaped not only by classroom instructional strategies but also by the broader school culture that continuously reinforces students' learning experiences. This suggests that school culture should be understood as an integral component of the pedagogical ecosystem that supports the successful implementation of the Deep Learning approach.

Figure 2. *An Integrated Deep Learning Implementation Model for Islamic Religious Education at SD Negeri 01 Sawahan, Padang City*

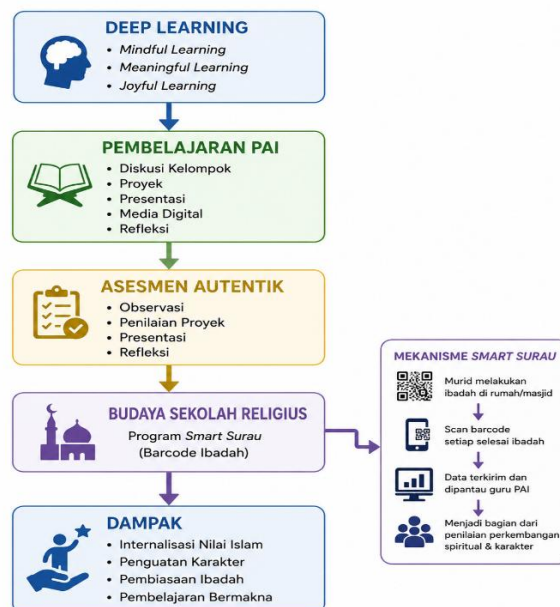


Figure 2 illustrates the framework for implementing the Deep Learning approach in Islamic Religious Education (IRE). The implementation begins with the application of the three core principles of Deep Learning – mindful learning, meaningful learning, and joyful learning – which are operationalized through instructional strategies such as collaborative group discussions, project-based learning, student presentations, the use of digital learning media, and reflective activities. These instructional processes are subsequently reinforced through authentic assessment that holistically evaluates students' cognitive, practical, and affective competencies.

A distinctive feature of this framework is the integration of the school's religious culture through the barcode-based Smart Surau program, which enables teachers to monitor students' religious practices beyond the school setting. This integration contributes to more meaningful learning experiences by strengthening character development, fostering habitual religious practice, and supporting the continuous internalization of Islamic values.

Furthermore, the proposed framework extends previous studies that have generally conceptualized the Deep Learning approach primarily as a classroom-based instructional strategy. The findings of this study demonstrate that the effectiveness of the Deep Learning approach is also shaped by the presence of a supportive school ecosystem that reinforces value formation through a religious school culture. Accordingly, school culture should be understood not merely as

the context in which learning occurs but as an integral pedagogical component that sustains students' learning experiences beyond the classroom.

Table 3
Comparison of the Present Study with Previous Research

Aspect	Previous Research	Present Study
Focus	General implementation of the Merdeka Curriculum	Implementation of Deep Learning in Islamic Religious Education (PAI)
Research Context	Various schools	Primary school with a religious school culture program
Novelty	Curriculum implementation analysis	Integration of learning practices and school culture through the Smart Surau program
Contribution	Description of curriculum implementation	An integrated Deep Learning implementation model

Table 4
Theoretical Extension of the Present Study

Previous Understanding	Present Contribution
Implementation model of integrated Deep Learning	Empirical evidence on the integration of the Deep Learning approach with school religious culture

From a theoretical perspective, this study enriches the literature on the implementation of the Deep Learning approach in the context of Islamic Religious Education at the elementary school level by highlighting the role of school culture as an essential component of the pedagogical ecosystem that strengthens the learning process. The findings demonstrate that the Deep Learning approach is relevant not only as a classroom pedagogical strategy but also as an approach that becomes more effective when embedded within a school environment that continuously promotes value formation, reflection, and the internalization of religious teachings.

From a practical perspective, this study provides empirical evidence that integrating the Deep Learning approach with the Smart Surau program can

support more meaningful learning experiences by combining habitual religious practice with authentic assessment of students' spiritual development. These findings may serve as a valuable reference for schools seeking to strengthen the implementation of the Deep Learning approach through school-based religious culture initiatives.

From a policy perspective, the findings underscore the importance of strengthening religious school culture as an integral component of the implementation of the Merdeka Curriculum. They also highlight the need for sustained professional development programs that enable teachers to implement the Deep Learning approach more consistently, adaptively, and contextually.

D. Conclusion

The findings of this study demonstrate that the Deep Learning approach has been implemented in Islamic Religious Education (IRE) at SD Negeri 01 Sawahan through student-centered instructional practices, including collaborative group discussions, project-based learning, student presentations, digital learning media, and reflective activities. The application of the principles of mindful learning, meaningful learning, and joyful learning encouraged students' active engagement in constructing knowledge while facilitating the internalization of Islamic values through contextual learning experiences. Nevertheless, the implementation of the Deep Learning approach continues to face several challenges, including limited instructional resources, the diversity of students' learning characteristics, and the need to further strengthen teachers' pedagogical competencies.

This study also demonstrates that the implementation of the Deep Learning approach is supported not only by classroom instructional strategies but also by the school's religious culture through the barcode-based Smart Surau program. The program extends learning beyond the classroom by promoting habitual religious practices, continuous monitoring, and authentic assessment of students' spiritual development. These findings provide empirical evidence that school culture can function as an integral component of the pedagogical ecosystem, strengthening meaningful learning experiences and facilitating the internalization of Islamic values.

From a practical perspective, the findings suggest that the successful implementation of the Deep Learning approach requires synergy among student-centered instructional strategies, authentic assessment, and a school culture that reinforces value formation through everyday practice. Accordingly, schools

should strengthen religious culture initiatives such as the Smart Surau program while providing sustained professional development to enhance teachers' pedagogical capacity for implementing the Deep Learning approach effectively.

Future research is recommended to examine the implementation of the Deep Learning approach across different educational levels and school contexts to develop a broader understanding of its application in Islamic Religious Education.

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