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Reconceptualizing Teacher Readiness for Deep Learning: Challenges and Adaptive Practices in Islamic Religious Education

Wini Afriani,[1*] Rahmi Wiza[2]
*afrianiwini4@gmail.com
[1,2] Universitas Negeri Padang, Indonesia

Abstract

This study aims to reconceptualize teacher readiness for deep learning by examining the challenges faced by Islamic Religious Education teachers and the adaptive practices they employ during the implementation of deep learning within the Merdeka Curriculum. Although deep learning has been widely promoted as an innovative pedagogical approach capable of fostering meaningful understanding, critical thinking, reflection, and character development, its successful implementation remains highly dependent on teachers' readiness to translate its principles into classroom practice. This study adopted a qualitative descriptive design and was conducted at SMA Negeri 1 Sutera, Pesisir Selatan Regency, Indonesia, from May to June 2026. Data were collected through participatory classroom observations, semi-structured interviews, and document analysis involving two Islamic Religious Education teachers, one vice principal for curriculum affairs, and eight Grade XI students selected through purposive sampling. Data were analyzed using the interactive model of Miles, Huberman, and Saldaña, while trustworthiness was established through source and method triangulation. The findings indicate that the implementation of deep learning is constrained by both internal and external factors. Internal challenges include limited conceptual understanding of mindful, meaningful, and joyful learning, difficulties in designing deep learning-oriented instruction, uneven pedagogical content transformation, and limited integration of educational technology. External challenges involve infrastructural limitations, restricted instructional time, and diverse student characteristics. Despite these challenges, teachers demonstrated adaptive practices through continuous professional learning, instructional adjustments, gradual technology utilization, and reflective evaluation. The novelty of this study lies in its reconceptualization of teacher readiness as a dynamic and multidimensional construct encompassing conceptual, pedagogical, technological, reflective, and institutional dimensions. This study contributes to the literature by extending current understandings of deep learning implementation in Islamic Religious Education and providing an empirically grounded framework for strengthening teacher readiness and pedagogical transformation in religious education contexts.

Keywords: deep learning; teacher readiness; Islamic Religious Education; pedagogical transformation; reflective practice; educational innovation.

Introduction

Law Number 20 of 2003 concerning the National Education System defines education as a deliberate and planned effort to create learning environments that enable learners to develop their spiritual potential, personality, intelligence, noble character, and skills required for themselves, society, the nation, and the state. Within this framework, Islamic Religious Education (IRE) occupies a strategic position because it functions not only as a means of transmitting religious knowledge but also as a vehicle for character formation, moral internalization, and the cultivation of students' spiritual awareness. Consequently, IRE should not merely focus on cognitive mastery but also foster meaningful understanding that leads to attitudinal and behavioral transformation. In line with the Merdeka Curriculum policy, which emphasizes competency development, character formation, and student-centered learning (Kemendikbudristek, 2021), IRE learning should be designed to be contextual, reflective, and relevant to students' real-life experiences.

Global educational reforms have also shifted the focus of learning from content acquisition toward knowledge construction, reflection, and knowledge transfer. In this regard, the concept of *deep learning* has gained significant attention as an approach that enables students to develop profound conceptual understanding through active engagement in learning processes (Mystakidis, 2021). Deep learning is not merely concerned with acquiring higher-order knowledge; rather, it emphasizes learners' ability to connect new information with prior experiences, develop critical thinking skills, solve problems, and apply knowledge in authentic contexts (Michael, 2004; Sharan, 2015). Winje and Løndal (2020) further argue that deep learning is fundamentally associated with *meaningful learning* and the transfer of knowledge across diverse situations, making it highly relevant to contemporary educational demands.

Despite its growing prominence, the implementation of deep learning remains challenging in many school contexts. Islamic Religious Education in Indonesia is still largely characterized by teacher-centered instructional practices dominated by lectures, memorization, and written assignments. Such practices often position students as passive recipients of information and provide limited opportunities for critical reflection and meaningful knowledge construction. Research has consistently demonstrated that meaningful learning emerges when students actively construct knowledge through collaborative, contextualized, and experiential learning processes (Hung, 2019; Polman et al., 2021). Within the context of IRE, the predominance of rote learning may hinder the internalization of religious values, resulting in a textual understanding of religion that is not fully reflected in students' everyday behavior and decision-making.

These challenges are further intensified by the demands of twenty-first-century education, which emphasize critical thinking, creativity, communication, and collaboration as essential competencies. Teachers are no

longer expected to function solely as transmitters of knowledge; rather, they are required to facilitate learning environments that promote inquiry, reflection, and knowledge construction (Fajriyah, 2022). Previous studies indicate that successful deep learning implementation is strongly influenced by teachers' ability to design authentic, reflective, and student-centered learning experiences (Bruno & Dell'Aversana, 2018; Chang, 2019). Therefore, teacher readiness becomes a critical determinant of whether educational transformation toward deep learning can be effectively achieved.

In recent years, the concept of *teacher readiness* has emerged as a central concern in educational reform and innovation. Teacher readiness extends beyond the possession of conceptual knowledge regarding a particular instructional approach; it encompasses pedagogical competence, technological proficiency, professional beliefs, attitudes toward change, and adaptive capacity in responding to curriculum reforms (Islam et al., 2026; Buabeng & Amo-Darko, 2025). Bentri et al. (2022) demonstrated that digital pedagogical competence is an essential prerequisite for supporting twenty-first-century learning transformation. Similarly, previous research has highlighted the significant contribution of sustained professional development programs in strengthening teachers' pedagogical competence and curriculum implementation capacity (Visser et al., 2010; Gibson & Brooks, 2012; Ali et al., 2026). These findings suggest that the success of deep learning implementation cannot be separated from the readiness of teachers as the primary actors in educational practice.

Within the context of Islamic Religious Education, teacher readiness becomes increasingly significant because deep learning requires teachers to design problem-based learning activities, facilitate critical reflection, integrate technology meaningfully, and employ authentic assessment strategies that evaluate both learning processes and outcomes comprehensively (Kovač et al., 2025; Yang & Lay, 2025). Furthermore, teachers are expected to develop reflective capacities that enable them to continuously evaluate and improve their instructional practices (Bulpitt & Martin, 2005; ElSayary et al., 2025). However, previous studies indicate that many educators still struggle to fully understand the conceptual foundations of deep learning and to translate these principles into concrete classroom practices (Winje & Løndal, 2020; Sergis & Sampson, 2019).

Although research on deep learning and teacher readiness has expanded considerably across various educational settings, studies specifically examining how Islamic Religious Education teachers understand, experience, and respond to the challenges of deep learning implementation remain limited. Existing literature has predominantly focused on digital competence development, competency-based curriculum implementation, and technology-enhanced learning environments (Bentri et al., 2022; Zhao, 2026). Comparatively little attention has been devoted to investigating Islamic Religious Education teachers as key actors in pedagogical transformation toward deep learning. This gap is particularly important because IRE integrates cognitive, affective, and spiritual dimensions, thereby presenting

unique pedagogical challenges that differ from those encountered in other subject areas. Consequently, a significant research gap exists regarding how teacher readiness in IRE is constructed, what barriers teachers encounter, and what adaptive strategies they employ in implementing deep learning.

Preliminary observations conducted between October 1 and November 30, 2025, at SMA Negeri 1 Sutera, Pesisir Selatan Regency, revealed that although the school had organized socialization programs and training sessions on deep learning prior to the first semester of the 2025/2026 academic year, classroom practices in Islamic Religious Education remained predominantly teacher-centered. Learning activities continued to rely heavily on lectures and written assignments, with limited incorporation of meaningful, reflective, and contextual learning principles. These findings suggest a discrepancy between educational policies promoting deep learning and the realities of classroom implementation. More importantly, they indicate that the challenges associated with deep learning implementation are not merely related to curriculum policies but are closely linked to teachers' readiness to understand, embrace, and adapt this pedagogical approach within their daily instructional practices.

Based on this background, the present study seeks to reconceptualize *teacher readiness* for deep learning implementation in Islamic Religious Education by examining the challenges and adaptive practices of teachers at SMA Negeri 1 Sutera, Pesisir Selatan. Specifically, this study aims to: (1) analyze the challenges encountered by Islamic Religious Education teachers in implementing deep learning-based instruction, and (2) identify the adaptive practices developed by teachers to address these challenges. Unlike previous studies that tend to conceptualize teacher readiness primarily as a technical construct focused on competence or training, this research approaches teacher readiness as a multidimensional construct encompassing pedagogical, professional, reflective, technological, and institutional dimensions. Accordingly, this study is expected to contribute theoretically to the development of the concept of *teacher readiness for deep learning* within the field of Islamic education while also providing practical recommendations for schools, curriculum developers, and policymakers seeking to strengthen meaningful learning and character-oriented educational transformation.

Method

This study employed a qualitative descriptive approach to gain an in-depth understanding of the implementation of deep learning within Islamic Religious Education (IRE) learning practices at SMA Negeri 1 Sutera. A qualitative descriptive design was considered appropriate because it enables researchers to explore participants' experiences, perceptions, and interpretations of educational phenomena within their natural settings (Waruwu, 2023). Rather than testing predetermined hypotheses, the study sought to understand how teachers interpret the concept of deep learning, the challenges they encounter during implementation, and the adaptive practices

they develop in response to these challenges. Qualitative inquiry is particularly suitable for investigating educational change processes because it facilitates a comprehensive examination of contextual, social, and pedagogical dimensions that shape instructional practices (Merriam & Tisdell, 2016; Creswell & Poth, 2018).

The research was conducted between May and June 2026 at SMA Negeri 1 Sutera, located in Sutera District, Pesisir Selatan Regency, West Sumatra, Indonesia. The site was selected purposively based on three considerations. First, the school had begun implementing deep learning principles within the framework of the Merdeka Curriculum. Second, preliminary observations indicated the existence of various pedagogical challenges related to deep learning implementation in Islamic Religious Education classrooms. Third, the school represented a relevant setting for examining teacher readiness and instructional adaptation during an ongoing educational transformation process (Patton, 2015).

The study involved eleven participants selected through purposive sampling. Purposive sampling was employed to ensure that participants possessed direct experience and substantial involvement in the phenomenon under investigation (Sugiyono, 2013; Patton, 2015). The participants consisted of two Islamic Religious Education teachers, one vice principal responsible for curriculum affairs, and eight Grade XI students (Phase F). The teacher participants were selected because they were directly responsible for planning, implementing, and evaluating deep learning-oriented instruction. The vice principal was included to provide institutional perspectives regarding curriculum implementation and educational policies. Student participants were selected to represent diverse learning experiences and levels of engagement within Islamic Religious Education classes. The inclusion of multiple participant groups enabled the study to capture diverse perspectives and strengthen the credibility of findings through data triangulation (Fusch et al., 2018).

In qualitative research, the researcher served as the primary instrument responsible for data collection, interpretation, and analysis (Sari et al., 2025). To support systematic data gathering, several supplementary instruments were utilized, including semi-structured interview protocols, classroom observation sheets, and document analysis guides. The interview protocol was designed to explore participants' understanding of deep learning, perceptions of instructional readiness, encountered challenges, and adaptive strategies employed during implementation. Observation sheets focused on classroom interactions, learning activities, student engagement, instructional methods, and assessment practices. Document analysis included examination of teaching modules, lesson plans, curriculum documents, assessment records, and school reports related to deep learning implementation.

Data were collected through three complementary techniques: observation, interviews, and documentation. First, participatory classroom observations were conducted to examine instructional planning, teacher–

student interactions, learning activities, and classroom dynamics during Islamic Religious Education lessons (Yusra et al., 2021). Observations were carried out repeatedly throughout the research period to capture recurring patterns and variations in instructional practices. Second, semi-structured interviews were conducted with all participants to obtain rich descriptions of their experiences, perceptions, and reflections regarding deep learning implementation. Semi-structured interviews allowed flexibility for participants to elaborate on emerging issues while ensuring consistency across interviews (Creswell & Poth, 2018). Each interview lasted approximately 45–60 minutes and was audio-recorded with participants' consent. Third, documentation was collected to provide contextual information and corroborate findings derived from observations and interviews. The integration of these data collection methods enabled methodological triangulation and enhanced the comprehensiveness of the study (Flick, 2018).

Data analysis followed the interactive model developed by Miles, Huberman, and Saldaña (2014), which emphasizes continuous interaction among data collection, data condensation, data display, and conclusion drawing. The analysis began with data transcription and familiarization, during which interview recordings and field notes were reviewed repeatedly to achieve a holistic understanding of the data. Subsequently, open coding was conducted to identify meaningful units related to teacher readiness, pedagogical challenges, institutional support, technological competence, and adaptive instructional practices. Similar codes were then grouped into broader categories and themes through an iterative comparative process (Saldaña, 2021). The emerging themes were continuously refined through discussions among the research team and repeated comparison with raw data to ensure analytical consistency. Data saturation was considered achieved when no substantially new themes emerged from subsequent interviews and observations (Fusch & Ness, 2015).

To ensure the trustworthiness of the findings, the study employed several validation strategies based on Lincoln and Guba's (1985) criteria of credibility, transferability, dependability, and confirmability. Credibility was enhanced through prolonged engagement in the field, member checking, and triangulation of both data sources and collection techniques. Member checking involved sharing preliminary interpretations with participants to verify the accuracy of researchers' interpretations. Transferability was supported through thick description of the research context, participants, and instructional setting, enabling readers to assess the applicability of findings to other contexts. Dependability was strengthened through maintaining an audit trail documenting research decisions, coding procedures, and analytical processes. Confirmability was established through reflexive journaling and systematic documentation of data analysis procedures to minimize researcher bias (Lincoln & Guba, 1985; Nowell et al., 2017).

Ethical considerations were carefully observed throughout the research process. Prior to data collection, participants received detailed explanations regarding the purpose of the study, voluntary participation, confidentiality

procedures, and their right to withdraw at any stage without consequence. Written informed consent was obtained from all participants, while parental consent was secured for student participants. To protect anonymity, pseudonyms were used in all transcripts and research reports. Data were securely stored and accessed only by the research team. These ethical procedures were implemented in accordance with established qualitative research standards and principles of educational research ethics (Creswell & Poth, 2018).

Results and Discussion

Results

During the 2025/2026 academic year, SMA Negeri 1 Sutera began implementing deep learning-based instruction as part of the Merdeka Curriculum policy. The implementation was initiated through a series of socialization programs and professional development workshops for teachers, including Islamic Religious Education (IRE) teachers, prior to the commencement of the first semester. However, preliminary classroom observations revealed that the implementation of deep learning principles was not yet consistent or optimal across learning activities. A noticeable gap remained between the conceptual understanding acquired through training and the actual classroom practices observed during instruction. This finding suggests that curriculum innovation does not automatically translate into pedagogical transformation, particularly when teachers are still adapting to new instructional paradigms. The results are presented in two major themes: (1) challenges encountered by Islamic Religious Education teachers in implementing deep learning, and (2) adaptive practices employed to address these challenges.

Challenges Faced by Islamic Religious Education Teachers in Implementing Deep Learning

The findings indicate that the challenges experienced by teachers originated from both internal and external factors. Internal factors were associated with teachers' knowledge, pedagogical competence, and technological skills, whereas external factors were related to institutional conditions, infrastructure, instructional time allocation, and student diversity.

Internal Challenges

1. Limited Conceptual Understanding of Deep Learning

The most significant challenge identified in this study was teachers' limited conceptual understanding of deep learning, particularly regarding the practical application of its three core principles: *mindful learning, meaningful learning,* and *joyful learning*. Although both Islamic Religious Education teachers had participated in training sessions and were familiar with the

general concept of deep learning, they acknowledged difficulties in translating these principles into concrete classroom practices.

One teacher explained: "In implementing deep learning-based instruction, my understanding of the deep learning concept still needs to be strengthened. Although I already know the basic concept, I still experience some difficulties in applying it to activities related to mindful, meaningful, and joyful learning." *(Interview with an Islamic Religious Education teacher at SMA Negeri 1 Sutera, May 21, 2026).*

This statement indicates that teachers' understanding remained largely conceptual rather than operational. While they were aware of the theoretical foundations of deep learning, they lacked sufficient pedagogical confidence to transform these ideas into effective instructional strategies. Similar concerns were expressed by Mr. Ropi Guspirman, S.Pd.I., who emphasized that limited understanding of deep learning represented the primary obstacle in implementing the approach within Islamic Religious Education classes.

Observational data partially confirmed these perceptions. Teachers frequently encouraged students to participate through questioning activities and contextual problem-solving tasks related to Islamic values. Students reported that teachers often initiated lessons with thought-provoking questions and invited them to analyze real-life situations from an Islamic perspective. Nevertheless, these activities generally remained at the level of participation and discussion rather than fostering sustained reflection and metacognitive awareness. Consequently, the findings suggest that while elements of deep learning were present, they had not yet fully reflected the deeper reflective processes associated with authentic *mindful learning*.

2. Difficulties in Designing Deep Learning-Oriented Instruction

Another significant challenge concerned instructional planning. Both teachers reported difficulties in designing teaching modules and learning activities that simultaneously embodied the principles of mindful, meaningful, and joyful learning.

Mr. Ropi explained that one of the most difficult aspects was developing learning activities that could actively engage all students while maintaining meaningful intellectual and spiritual engagement throughout the lesson. Teachers frequently struggled to determine how classroom activities should be structured to encourage critical thinking, reflection, and active participation among learners with diverse characteristics.

Classroom observations revealed that lesson plans generally incorporated discussion activities, question-and-answer sessions, and group assignments. However, these activities were often implemented as routine instructional techniques rather than as intentionally designed opportunities for deep conceptual exploration. Interestingly, student interviews indicated that discussion and opinion-sharing activities occurred regularly during lessons. This discrepancy suggests that the challenge was not the absence of discussion itself but rather the extent to which discussion facilitated critical

reflection, value internalization, and higher-order thinking. In other words, teachers were able to organize interactive activities but still encountered difficulties in transforming these interactions into genuine deep learning experiences.

3. Uneven Mastery of Islamic Religious Education Content

Observations conducted across multiple classroom sessions also revealed difficulties related to content mastery and pedagogical delivery. Teachers occasionally experienced challenges in planning, explaining, and contextualizing Islamic Religious Education content according to deep learning principles. As a result, instructional practices sometimes reverted to conventional lecture-based approaches.

Mrs. Dwina explained that time constraints frequently encouraged teachers to rely on familiar instructional methods that were considered more practical and easier to implement. This tendency reflected the complex relationship between content mastery and pedagogical innovation. Although teachers possessed adequate subject matter knowledge, translating religious concepts into reflective, contextual, and student-centered learning experiences required additional pedagogical competencies.

Observation data further demonstrated that lessons emphasizing factual knowledge tended to be delivered through teacher explanations, whereas opportunities for student inquiry, reflection, and collaborative problem-solving were less consistently integrated. Consequently, limited pedagogical content transformation emerged as an internal challenge affecting the implementation of deep learning within Islamic Religious Education classrooms.

4. Limited Utilization of Educational Media and Technology

The findings also revealed challenges associated with the integration of educational media and digital technology. Both teachers acknowledged that they had not yet been able to utilize available technological resources optimally in every lesson. Technical limitations related to operating educational applications and digital devices often reduced the frequency and effectiveness of technology integration.

From the students' perspective, however, the use of multimedia resources contributed positively to learning engagement. Students reported enjoying lessons that incorporated videos, interactive quizzes, Islamic inspirational stories, and ice-breaking activities. Such activities created a more enjoyable learning atmosphere and increased motivation to participate.

Classroom observations confirmed that technology-supported instruction was generally more interactive and engaging than traditional lecture-based sessions. Nevertheless, the use of technology remained conditional and inconsistent. Teachers tended to employ digital tools only when technological facilities were readily accessible and functioning properly. Consequently, technology integration had not yet become an integral component of routine instructional practice.

External Challenges

1. Limitations in School Facilities and Infrastructure

Deep learning requires supportive learning environments, including adequate classroom facilities, digital devices, and reliable internet connectivity. Although SMA Negeri 1 Sutera possessed several technological resources, including smartboards, projectors, and relatively comfortable classrooms, not all facilities could be utilized optimally.

Teachers reported that the limited number of available devices, occasional technical problems, and unstable internet connectivity hindered the implementation of technology-enhanced learning activities. Interestingly, none of the interviewed students identified infrastructure as a major concern. This discrepancy suggests that infrastructural limitations were experienced more strongly by teachers, who were responsible for designing and facilitating instruction, than by students, who primarily experienced the outcomes of classroom activities.

2. Limited Instructional Time Allocation

Another external challenge involved the limited instructional time allocated to Islamic Religious Education. With only three instructional hours per week, teachers perceived the available time as insufficient for implementing comprehensive deep learning activities that required extended reflection, collaborative discussion, and problem-solving processes.

Furthermore, the scheduling structure contributed to instructional discontinuity. The separation of class periods by recess interruptions often reduced student concentration and disrupted the flow of learning activities. Teachers reported difficulties maintaining momentum during reflective discussions because students' attention tended to decline prior to breaks, thereby limiting opportunities for sustained engagement with complex issues.

Observations supported these concerns. Several learning activities intended to facilitate reflection and discussion had to be shortened due to time constraints, resulting in lessons that emphasized content completion rather than deeper exploration of ideas and values.

3. Diversity of Student Characteristics and Learning Abilities

The diversity of student abilities, motivation levels, and learning characteristics represented another significant challenge. Both teachers reported difficulties in ensuring that all students participated actively in deep learning activities.

Some students demonstrated high levels of enthusiasm and engagement, particularly when learning activities were connected to real-life experiences and contemporary social issues. Others, however, required more intensive guidance and were less confident in expressing opinions or participating in classroom discussions.

Although all eight interviewed students generally expressed positive perceptions of learning experiences, observational data revealed considerable

variation in participation levels. Some students frequently contributed ideas and reflections, whereas others remained passive observers during discussions. This diversity posed challenges for teachers attempting to facilitate inclusive learning experiences that supported the development of reflective thinking and value internalization among all learners.

The findings suggest that differentiated instructional strategies are necessary to ensure that deep learning opportunities are accessible to students with varying levels of readiness, confidence, and academic ability.

Adaptive Practices Employed by Islamic Religious Education Teachers

Despite encountering various internal and external challenges, Islamic Religious Education teachers demonstrated several adaptive practices aimed at strengthening the implementation of deep learning.

Strengthening Conceptual Understanding of Deep Learning

Teachers actively sought to improve their understanding of deep learning by reading additional references, engaging in professional discussions with colleagues, and participating in training programs organized by schools and educational authorities. These efforts reflected teachers' commitment to professional learning and pedagogical improvement.

Students also acknowledged that teachers were generally able to explain Islamic Religious Education concepts using simple language and examples closely related to daily life. This suggests that although teachers continued to develop their understanding of deep learning, they were already attempting to translate theoretical concepts into accessible learning experiences.

Adjusting Teaching Methods and Instructional Strategies

Teachers gradually adapted their instructional strategies to align with students' characteristics and the principles of deep learning. The principle of *mindful learning* was implemented through activities encouraging concentration, critical thinking, and reflection. *Meaningful learning* was promoted by connecting Islamic teachings to students' everyday experiences, particularly in discussions concerning morality, honesty, and social responsibility. Meanwhile, *joyful learning* was facilitated through ice-breaking activities, discussions, interactive questioning, collaborative learning, and the use of engaging instructional media.

Observational evidence indicated that these strategies increased student participation and created a more dynamic classroom atmosphere. Although implementation remained uneven, the gradual incorporation of these principles represented a meaningful shift away from purely teacher-centered instruction.

Gradual Integration of Educational Media and Technology

Teachers also attempted to maximize the use of available technological resources, including projectors, smartboards, educational videos, and interactive platforms such as Quizizz. These tools were used to enhance student motivation and create more engaging learning experiences.

Students confirmed that lessons combining teacher explanations with visual presentations and multimedia resources were easier to understand and more enjoyable. However, technology integration remained dependent on device availability and internet connectivity, resulting in inconsistent implementation across different learning sessions.

Continuous Evaluation and Reflective Practice

A final adaptive strategy involved ongoing evaluation and reflection. Teachers regularly reviewed their instructional practices, identified weaknesses, and explored possible improvements for future lessons. This reflective orientation demonstrated an emerging awareness of the importance of continuous professional growth in implementing deep learning.

The vice principal for curriculum affairs emphasized that evaluation efforts were intended to ensure that students developed a conscious understanding of the relationships among concepts and actively participated in learning processes. Nevertheless, the findings revealed that evaluation practices remained largely focused on daily classroom activities and short-term learning outcomes.

Observations and document analysis indicated that authentic assessment practices capable of measuring deep understanding, reflective thinking, and affective engagement had not yet been fully developed. Therefore, while reflective evaluation had become part of teachers' professional practice, further development is required to align assessment approaches with the broader goals of deep learning.

Overall, the findings demonstrate that the implementation of deep learning in Islamic Religious Education at SMA Negeri 1 Sutera remains a work in progress. The primary challenges involve limited conceptual understanding, instructional design difficulties, uneven pedagogical content transformation, constrained technology integration, infrastructure limitations, restricted instructional time, and diverse student characteristics. At the same time, teachers have demonstrated adaptive responses through professional learning, instructional adjustment, gradual technology integration, and reflective practice. These findings indicate that teacher readiness for deep learning should be understood as a multidimensional and evolving process involving pedagogical, technological, reflective, and institutional dimensions rather than merely the acquisition of technical knowledge about a new instructional approach.

Discussion

The findings of this study demonstrate that the challenges encountered by Islamic Religious Education (IRE) teachers in implementing deep learning are fundamentally rooted in the discrepancy between the pedagogical demands of innovative learning approaches and teachers' actual readiness to enact those approaches in classroom practice. This finding reinforces the argument of Dauly et al. (2022), who emphasize that the effectiveness of learning depends on the interaction among multiple educational components,

including teachers, students, instructional methods, learning media, and the learning environment. When one or more of these components do not function optimally, the entire learning process is likely to be affected. In the present study, the most influential barriers emerged from teachers' limited conceptual understanding of deep learning and their difficulties in translating its principles into instructional design and classroom implementation. This finding suggests that the transition from conventional pedagogy to deep learning-oriented instruction requires more than policy directives and training workshops; it requires a transformation of teachers' pedagogical beliefs, professional competencies, and reflective practices.

The dominance of internal factors identified in this study aligns with Hidayat and Junaidi (2024), who argue that teachers' internal capacities significantly determine the quality of learning implementation. More specifically, the findings indicate that teachers' conceptual understanding of deep learning remains largely procedural rather than transformative. Although teachers were familiar with the terminology and general principles of *mindful, meaningful,* and *joyful learning*, they continued to struggle with operationalizing these concepts into learning experiences that foster reflection, critical inquiry, and value internalization. This finding is consistent with Kovač et al. (2025), who emphasize that one of the most common obstacles in deep learning implementation is the tendency of educators to interpret deep learning as a set of instructional activities rather than as a holistic pedagogical framework that promotes conceptual understanding, knowledge transfer, and learner transformation. Similarly, Winje and Løndal (2020) argue that deep learning requires teachers to facilitate sustained reflective engagement rather than merely increasing student participation. The present study confirms this concern, as classroom discussions were frequently observed, yet these discussions often remained at the level of information exchange and had not consistently evolved into deeper reflective processes.

The findings further reveal that difficulties in designing deep learning-oriented instruction constitute a significant pedagogical challenge. Teachers reported uncertainty regarding how to design teaching modules capable of simultaneously incorporating mindful, meaningful, and joyful learning principles. This challenge reflects broader concerns identified in international literature regarding teacher readiness for educational innovation. Yang and Lay (2025) argue that successful implementation of deep learning requires sophisticated pedagogical competencies, including the ability to design authentic learning experiences, facilitate collaborative inquiry, and promote higher-order thinking. Likewise, Sergis and Sampson (2019) emphasize that pedagogical transformation involves not only adopting new instructional strategies but also redesigning learning environments that encourage active knowledge construction. The present findings support these perspectives by demonstrating that teachers often experienced difficulties not because they lacked instructional activities, but because they lacked frameworks for structuring those activities into coherent deep learning experiences.

Consequently, the challenge lies less in the presence of discussion-based learning and more in the quality and depth of the learning process itself.

Another important finding concerns the uneven integration of content mastery and pedagogical practice. Teachers frequently reverted to conventional lecture-based methods, particularly when confronted with time constraints and complex subject matter. This finding may be interpreted through the lens of pedagogical content knowledge, which suggests that effective teaching requires not only mastery of content but also the ability to transform that content into meaningful learning experiences. Previous research by Bruno and Dell'Aversana (2018) highlights the importance of reflective pedagogical competence in educational innovation, arguing that teachers must continuously adapt instructional approaches to align with learning objectives and student needs. Similarly, Chang (2019) found that reflective teaching practices are critical for supporting pedagogical transformation and sustaining educational change. The findings of this study extend these arguments by demonstrating that Islamic Religious Education teachers require not only stronger content knowledge but also greater pedagogical flexibility in contextualizing religious concepts within students' everyday experiences.

The limited use of educational technology observed in this study also deserves particular attention. Although teachers recognized the potential of technology to support engagement and motivation, technological integration remained inconsistent and highly dependent on available infrastructure. This finding resonates with Bentri et al. (2022), who identify digital pedagogical competence as a crucial prerequisite for educational transformation in contemporary learning environments. Similarly, Buabeng and Amo-Darko (2025) argue that teacher readiness for technology-enhanced learning extends beyond technical skills and includes pedagogical confidence, digital literacy, and institutional support. The present findings suggest that technology integration in Islamic Religious Education remains largely instrumental rather than transformative. Teachers tended to use digital tools to support content delivery rather than to facilitate collaborative inquiry, reflection, or authentic problem-solving. Consequently, technological resources have not yet been fully utilized as catalysts for deep learning.

Beyond internal factors, the study highlights the continuing influence of external challenges, particularly limitations in infrastructure, instructional time, and student diversity. The findings reveal that while students generally responded positively to learning activities, teachers experienced considerable difficulty managing diverse learning needs within a limited instructional timeframe. These findings support the argument of Islam et al. (2026) that educational innovation is strongly influenced by contextual and institutional conditions. Teacher readiness cannot be understood solely as an individual characteristic but must be viewed within broader organizational and systemic environments. In the case of SMA Negeri 1 Sutera, limited instructional hours and technological constraints reduced opportunities for sustained reflection, collaborative inquiry, and authentic assessment, all of which are central

components of deep learning. This finding reinforces Zhao's (2026) argument that educational transformation requires alignment among curriculum design, institutional support, technological infrastructure, and teacher professional capacity.

An additional contribution of this study concerns the relationship between deep learning and Islamic educational philosophy. The findings demonstrate that teachers attempted to implement mindful, meaningful, and joyful learning by connecting Islamic teachings to students' daily lives, encouraging reflection, and creating engaging learning environments. These efforts reflect important parallels between deep learning and classical Islamic concepts such as *tafakkur* (critical contemplation), *tadabbur* (reflective understanding), and *muhasabah* (self-reflection). While previous studies have primarily examined deep learning from cognitive and pedagogical perspectives, the present findings suggest that Islamic Religious Education provides a unique context in which deep learning may serve not only academic objectives but also spiritual and moral development. This observation supports the argument of Mystakidis (2021) that deep learning should be understood as a transformative process involving intellectual, emotional, and ethical dimensions rather than merely academic achievement.

The adaptive strategies employed by teachers further demonstrate that teacher readiness is not a fixed condition but an evolving professional process. Teachers actively sought to improve their understanding of deep learning through self-directed learning, collegial collaboration, and participation in professional development activities. These efforts align with the findings of Ali et al. (2026), who emphasize the importance of continuous professional development in strengthening teachers' readiness for educational innovation. Likewise, ElSayary et al. (2025) argue that adaptability and reflective competence are essential characteristics of teachers operating within rapidly changing educational environments. The adaptive practices identified in this study suggest that although teachers may initially experience uncertainty and challenges, they can gradually develop greater readiness through reflective engagement and professional learning opportunities.

Nevertheless, the findings also reveal important limitations in current evaluation practices. Although teachers regularly reflected on their instructional experiences, assessment practices remained largely focused on daily learning outcomes and had not yet developed into comprehensive authentic assessment systems. This finding confirms previous studies by Sari et al. (2024) and Dinti et al. (2024), which identify authentic assessment as one of the weakest aspects of Islamic Religious Education pedagogy. From a deep learning perspective, assessment should not merely measure factual understanding but should also evaluate students' capacity for reflection, knowledge transfer, problem-solving, and value internalization. As emphasized by Kovač et al. (2025), meaningful deep learning requires alignment among learning objectives, instructional strategies, and assessment practices. Therefore, the absence of authentic assessment instruments may

limit the extent to which deep learning outcomes can be effectively measured and sustained.

Overall, the findings support previous studies (Khotimah & Abdan, 2025; Rahmawati et al., 2021; Abdussyukur & Zulfah, 2025; Hasanuddin et al., 2025; Wafa et al., 2025) demonstrating the considerable potential of deep learning to create more engaging, meaningful, and transformative Islamic Religious Education experiences. However, this study extends existing scholarship by revealing that the success of deep learning depends not only on instructional innovation but also on multidimensional teacher readiness encompassing conceptual understanding, pedagogical competence, reflective capacity, technological literacy, and institutional support. Accordingly, the findings suggest a reconceptualization of teacher readiness for deep learning as a dynamic and multidimensional construct rather than a purely technical competency. This conceptual contribution represents the primary novelty of the present study and provides a foundation for future research examining the relationship between teacher readiness, pedagogical transformation, and educational innovation within Islamic educational contexts.

Conclusion

This study reveals that teacher readiness for deep learning in Islamic Religious Education extends beyond the acquisition of instructional techniques and should be understood as a multidimensional construct encompassing conceptual understanding, pedagogical competence, reflective capacity, technological literacy, and institutional support. The findings demonstrate that the challenges experienced by Islamic Religious Education teachers at SMA Negeri 1 Sutera are rooted in both internal factors—such as limited conceptual understanding of deep learning, difficulties in instructional design, uneven pedagogical content transformation, and suboptimal technology integration—and external factors, including infrastructural constraints, limited instructional time, and diverse student characteristics. More importantly, the study finds that conceptual and pedagogical readiness exert a greater influence on the successful implementation of deep learning than previously assumed. This finding challenges the common assumption that curriculum reform and teacher training alone are sufficient to facilitate pedagogical transformation, and instead highlights the importance of sustained professional learning and reflective practice as central dimensions of educational change.

From a scholarly perspective, this study reinforces previous research emphasizing the critical role of teacher readiness in determining the success of deep learning implementation in Islamic Religious Education. At the same time, it extends existing literature by shifting attention from the outcomes of deep learning toward the underlying challenges and adaptive processes experienced by teachers during implementation. The study therefore contributes to the growing body of knowledge on deep learning by introducing a reconceptualization of teacher readiness as a dynamic and evolving process

rather than a static set of competencies. This perspective enriches current discussions on educational innovation, particularly within Islamic educational contexts, where cognitive, affective, and spiritual dimensions are simultaneously emphasized. Furthermore, the findings suggest that the principles of *mindful, meaningful,* and *joyful learning* can be meaningfully aligned with Islamic educational traditions that promote reflection, contemplation, and character formation.

Nevertheless, this study has several limitations. First, the research was conducted within a single school setting and involved a relatively small number of participants, which limits the generalizability of the findings to broader educational contexts. Second, the study focused specifically on the implementation of deep learning within Islamic Religious Education at the senior high school level, and therefore may not fully capture the experiences of teachers in other subjects or educational levels. Consequently, caution should be exercised when interpreting the findings beyond the specific context of this study.

Future research is recommended to involve larger and more diverse samples across multiple schools, regions, and educational levels to provide a more comprehensive understanding of teacher readiness for deep learning. Comparative studies examining different institutional contexts may further clarify how organizational support, professional development, and educational culture influence pedagogical transformation. Additionally, future investigations could explore the development and effectiveness of authentic assessment models, teacher professional learning frameworks, and technology-enhanced pedagogical interventions designed to strengthen deep learning implementation in Islamic Religious Education. Such efforts would contribute to a more robust understanding of how deep learning can be effectively integrated into contemporary Islamic educational practice while supporting students' intellectual, moral, and spiritual development.

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