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IMPLEMENTING DEEP LEARNING IN ARABIC LANGUAGE EDUCATION AT MADRASAH ALIYAH: ENHANCING CRITICAL THINKING AND CONTEXTUAL LEARNING

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Abstract

This study examines the implementation of deep learning in Arabic language education at Madrasah Aliyah (MA) in Indonesia. Employing a descriptive qualitative approach, data were obtained through library research and in-depth interviews with five Arabic teachers from different madrasah. The study identified five key instructional strategies applied by teachers: critical discussion, problem-solving, project-based learning (PjBL), student presentations, and the integration of digital tools and AI-based applications such as Kahoot and Quizizz. Critical discussion was consistently implemented across all madrasah, while the adoption of other strategies varied depending on institutional context and teacher readiness. Student responses toward interactive and technology-supported strategies were generally positive, demonstrating increased engagement and participation. Nevertheless, several challenges hinder optimal implementation, including limited technological infrastructure, rigid curricula, insufficient professional training, and assessment practices dominated by objective tests and lower-order thinking skills (LOTS). Authentic, project-based, and reflective assessments remain underutilized, resulting in a misalignment with the constructive alignment principle and limiting the comprehensive evaluation of learning outcomes. The findings suggest that while deep learning principles have begun to take root in Arabic language teaching at MA, achieving their full potential requires targeted interventions in infrastructure development, teacher capacity building, and the alignment of assessment practices with higher-order learning objectives.

Keywords: Deep Learning; Arabic Language Education; Critical Thinking; Educational Innovation; Madrasah Aliyah

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INTRODUCTION | مقدمة

The quality of education is a key element in driving the advancement of civilization and enhancing a nation's competitiveness (Mustofa & Haryono, 2023). Therefore, every level of education is required to conduct a learning process that is not only informative but also transformative, aiming to shape learners who are critical, creative, and adaptive to the changes of the times (Adien et al., 2025). One of the secondary education levels that plays a strategic role in this context is the *Madrasah Aliyah* (MA), an Indonesian secondary education institution that focuses on both academic development and Islamic education. Equivalent to senior high schools, MA not only equip students with general competencies but also strengthen religious values as an integral part of the core curriculum (Safitri, 2020).

In this context, Arabic language learning at the *Madrasah Aliyah* level needs to be directed toward a more meaningful and in-depth approach, in line with the demands of the 21st

century. To address these challenges, a learning approach is required that is not only informative but also transformative and oriented toward the development of higher-order thinking skills (Fitriani & Santiani, 2025). With the rapid advancement of technology and the growing need for mastering complex competencies, the deep learning approach in education has begun to gain widespread attention as a strategy to enhance the quality of learning.

In supporting the deep learning approach, several learning theories can serve as conceptual foundations. First, the theory of active learning emphasizes the importance of students' direct engagement in the learning process. Maryani et al. (2024) state that active learning occurs when students do more than merely listen; they must read, write, discuss, or engage in problem-solving activities. This aligns with the practice of deep learning, which requires students to construct profound understanding through interaction and reflection. Second, the constructivist theory, pioneered by Piaget and further developed by Vygotsky, posits that knowledge is actively constructed by individuals through experience and social interaction (Azzahra, 2025). In the context of Arabic language learning at MA, constructivism encourages the use of contextual learning strategies such as project-based learning and collaborative learning to build meaningful and relevant understanding for students (Syafe'i, 2016).

Deep learning in the educational context does not refer solely to artificial intelligence, but rather to a pedagogical approach that emphasizes deep understanding, critical thinking skills, and problem-solving abilities—elements generally considered superior to traditional learning approaches (Sariman, 2023). This approach focuses on learning that emphasizes deep conceptual understanding, advanced analytical skills, and reflective ability in processing and applying knowledge. Amid the wave of digital disruption and the developments of the Fourth Industrial Revolution, such learning strategies have become increasingly important in shaping a generation capable of analytical thinking, resilient in the face of change, and continuously innovative (Sariman et al., 2021).

The deep learning approach provides students with opportunities to explore concepts more profoundly, integrate various ideas coherently, and apply them in diverse real-life contexts. This learning model aligns with the principles of constructivism, which hold that learning becomes effective when students actively construct their own knowledge through direct experience and social interaction. Therefore, the implementation of deep learning in education is not merely about following an academic trend, but rather an urgent necessity in creating a responsive, creative, and future-oriented learning environment (Sari & Kadarismanto, 2025).

This approach also requires the active involvement of students in constructing knowledge both independently and collaboratively. A concrete example of applying the concept of deep learning in education can be found in the implementation of project-based learning, which has been adopted by several educational institutions in Indonesia (Siswandi et al., 2024). Several schools have integrated learning approaches that emphasize problem-solving, in-depth exploration, and the use of technology in the teaching and learning process. Various case studies indicate that students engaged in deep learning-based instruction tend to possess stronger analytical abilities and higher critical thinking skills compared to those taught through conventional approaches.

Previous studies have also reinforced the potential and relevance of deep learning in the context of modern education. Otto et al. (2020) explain that deep learning refers to an instructional approach that not only emphasizes content mastery but also includes the development of critical thinking, collaboration, creativity, and effective communication. The findings of Elbashbishy (2024) also indicate that deep learning enables students to be better

prepared for higher education and the workforce by equipping them with critical thinking skills and adaptability. This approach fosters a more comprehensive understanding of the subject matter, thereby enhancing retention and the ability to apply knowledge in various real-life contexts. In line with this, Hikmawati et al. (2024) assert that the emergence of various digital innovations in education provides greater opportunities for the younger generation to develop the 4C—Critical Thinking, Creativity, Collaboration, and Communication—which are key competencies in meeting global challenges in today's digital era.

Based on an analysis of previous studies, it can be concluded that the deep learning approach makes a significant contribution to improving the quality of learning, particularly in fostering critical thinking, problem-solving skills, and meaningful learning. Nevertheless, its implementation in the Indonesian educational context, especially at the *Madrasah Aliyah* (MA) level, still faces a number of challenges that cannot be overlooked. These challenges include limited digital infrastructure, low technological literacy among educators, and curricula still dominated by surface learning approaches oriented toward memorization and shallow mastery of material.

This situation is further exacerbated by the prevalence of traditional teaching practices in many MAs, where innovative pedagogical approaches have yet to be fully integrated into the teaching and learning process. In fact, the needs of learners in the digital era have shifted toward 21st-century skills that demand the integration of technology, creativity, and lifelong learning abilities. Therefore, this article seeks to explore in depth how the deep learning approach can be effectively implemented in Arabic language learning at MAs, taking into account learner characteristics, the context of religious education, and existing limitations.

Through a descriptive approach employing interview techniques, supported by literature review and critical analysis, this study is expected to provide practical and applicable recommendations for stakeholders—teachers, curriculum developers, and policymakers—in designing contextual deep learning implementation strategies. The ultimate goal is to promote a transformation of learning in MAs to become more adaptive to changing times and to prepare graduates who are not only academically excellent but also ready to face the challenges of higher education and the workforce in the digital era.

METHOD | منهج

Subsection Identification

This study employed a descriptive qualitative approach with two main data collection methods: literature review and semi-structured interviews. The literature review was conducted to gather and analyze various relevant sources, such as scholarly journals, books, and curriculum documents, discussing the concepts of deep learning, educational innovation, and their implementation in the context of Arabic language learning at the Madrasah Aliyah level.

In addition, semi-structured interviews were conducted in May 2025 with five Arabic language teachers from various madrasah. The interview questions focused on teachers' understanding of the deep learning concept, their teaching practices, and the challenges they face in implementing this approach.

This study adopted purposive sampling, a non-probability sampling technique in which participants were selected based on specific criteria deemed capable of providing in-depth and relevant information to the research focus (Abdullah et al., 2022). This technique aligns with the qualitative approach, which prioritizes data depth over statistical population representation.

The participant criteria included: (1) having at least three years of experience teaching Arabic at a Madrasah Aliyah, (2) representing madrasah that differ in geographical location and institutional background, and (3) being actively involved in the Arabic language teaching process. These criteria were intended to ensure the collection of rich and contextual data regarding the implementation of deep learning in Arabic language education.

Ethical considerations were taken seriously throughout the study. Informed consent was obtained from participants prior to the interviews. Participant identities were kept confidential, and all data were used solely for academic purposes.

Participant (Subject) Characteristics

The participants in this study consisted of five Arabic language teachers purposively selected from five different Madrasah Aliyah in Indonesia. This selection aimed to capture a diversity of perspectives from various educational institutions. All participants were active Arabic language teachers with a minimum of three years' teaching experience at the MA level.

Research Design

This study employed a descriptive qualitative design aimed at exploring the relevance and application of the deep learning approach in Arabic language instruction at the Madrasah Aliyah level. A qualitative approach was chosen as it allows for an in-depth exploration of teachers' perspectives, the pedagogical practices they employ, and the contextual challenges they face in implementing deep learning.

RESULT | نتائج

Literature Review Results

Analysis of several literatures shows that the deep learning approach in education emphasizes the development of higher-order thinking skills, such as critical thinking, creativity, collaboration, and communication (Otto et al., 2020). Furthermore, Elbashbishy (2024) asserts that the effective implementation of the deep learning approach can enhance deep conceptual understanding of learning materials. This positively impacts long-term retention as well as learners' ability to transfer and apply knowledge to various real-life situations, including those that differ from the original learning context.

Recent studies, such as those by Hikmawati et al. (2024), highlight that the implementation of the deep learning approach requires a conducive learning environment for independent exploration, experimentation, and social interaction. Strategies like project-based learning (PjBL), problem-based learning (PBL), and inquiry-based learning (IBL) represent concrete applications of this approach. In these strategies, learners are actively involved in problem-solving, designing solutions, and presenting learning outcomes through real projects relevant to their lives.

Interview Results with Teachers

Based on the identification of Arabic language teaching practices in five Madrasah Aliyah, five main strategies were found to be employed by teachers in deep learning-based instruction. The most frequently applied strategy was critical discussion, consistently observed across all madrasah. This was followed by problem-solving and Project-Based Learning (PjBL), implemented in four madrasah. Meanwhile, student presentations and the use of digital tools and AI-based applications were applied in three madrasah.

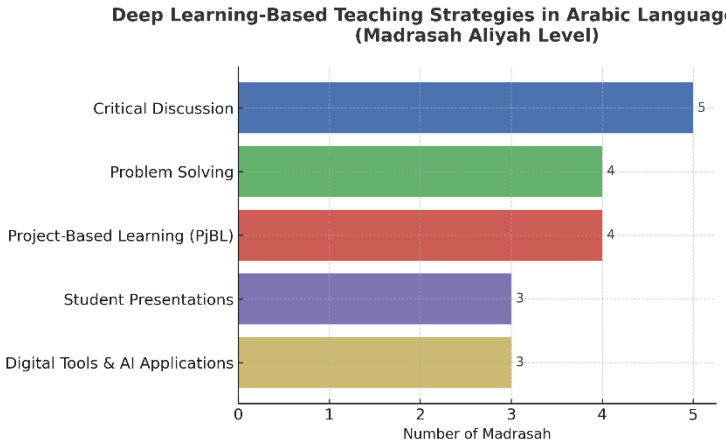

Figure 1. Deep Learning-Based Teaching Strategies in Arabic Language Education at Madrasah Aliyah

Regarding the use of digital tools, platforms such as Kahoot and Quizizz were utilized as part of the learning assessment process. Students' responses to these strategies varied. In some madrasah, students demonstrated high enthusiasm for the use of such interactive applications. However, in others, the implementation of digital strategies was hindered by limited device availability and unstable internet connectivity. Additionally, some students encountered difficulties with presentation strategies due to speaking anxiety and limited Arabic proficiency.

Overall, these findings indicate that Arabic language teachers at Madrasah Aliyah employ a range of deep learning-based teaching strategies, although the frequency and conditions of their application vary across institutions.

DISCUSSION | مناقشة

Implementing Deep Learning in Arabic Language Instruction at Madrasah Aliyah through Concepts Practices and Challenges

A thorough understanding of the concept of deep learning in education serves as a fundamental prerequisite for evaluating its application within the context of Arabic language instruction at the Madrasah Aliyah level. Rather than being limited to rote memorization or superficial comprehension of information, deep learning emphasizes a process of profound, reflective, and meaningful engagement with knowledge. This pedagogical approach prioritizes the development of higher-order thinking skills, including critical thinking, creativity, collaboration, and problem-solving (Cholifatunisa et al., 2025)

In the context of modern education, deep learning is regarded as a strategic response to the challenges of the digital era, which requires students not only to master knowledge but also to connect, apply, and transform it across various real-life situations Sari & Arta (2025). In line with this view, Adnyana (2024) emphasizes that this approach activates higher-order thinking processes essential for navigating the digital age. He also identifies three interrelated patterns within deep learning: meaningful learning, mindful learning, and joyful learning.

Based on the identification of Arabic language learning practices in five Madrasah Aliyah, five main strategies were found to be employed by teachers in the implementation of deep learning-based instruction. The most frequently applied strategy was critical discussion, observed consistently across all schools. This strategy aligns with the view of Nurlailah & Julkifli, (2025) who assert that critical discussion is central to deep learning as it encourages students to

construct meaning dialogically and deepen conceptual understanding in a critical manner. In practice, this activity provides space for students to express ideas, evaluate arguments, and construct understanding through active interaction. These findings affirm that dialogue-based approaches, such as discussion, are not merely teaching methods but key means to help students engage more deeply with meaning in the context of language learning.

The problem-solving strategy and Project-Based Learning (PjBL) were implemented in four madrasah. This strategy reflects the constructivist approach that characterizes deep learning, in which students are encouraged to actively engage in completing challenging and meaningful tasks. Mubarok et al. (2025) emphasize that PjBL can enhance critical and creative thinking skills, as students are involved in the processes of exploration, planning, and reflection on meaningful and contextual tasks. These findings indicate that the application of PjBL and problem-solving is not only conceptually aligned with deep learning principles but has also been reasonably well adapted to the local madrasah context, which, although modest, still provides space for authentic and transformative learning experiences.

Meanwhile, student presentations were implemented in three madrasah as part of a learner-centered approach to teaching. This approach positions students as active agents in the learning process, rather than mere recipients of information from the teacher. Within this framework, the teacher serves as a facilitator who creates a learning environment that encourages exploration, reflection, and active student participation in constructing understanding (Weimer, 2013). In this context, presentation activities function not only as a medium for expressing learning outcomes but also as a pedagogical strategy that cultivates structured thinking skills, public speaking abilities, and the confidence to present and defend arguments logically.

From the perspective of deep learning, presentations represent an active form of student reflection on the knowledge they have constructed themselves, and serve as indicators of the achievement of deep conceptual understanding. Such activities provide space for the integration of cognitive, affective, and social aspects. This aligns with the view of Fauziah et al. (2023) who argue that presentations foster the development of communication and critical thinking skills, while also facilitating students' emotional engagement in the language learning process in a more holistic manner.

Interestingly, the use of digital tools and artificial intelligence (AI)-based applications has also begun to be implemented in three madrasah as part of innovative strategies in Arabic language teaching. Several teachers employed applications such as Kahoot and Quizizz to strengthen vocabulary and grammar mastery through interactive quiz-based exercises. These platforms incorporate gamification elements and automated feedback systems to provide engaging and competitive learning experiences, while also helping students strengthen material retention more effectively. In a study by Ramadhan et al. (2025), the use of Quizizz in Arabic language instruction was found to significantly enhance student participation and learning motivation.

Although Kahoot and Quizizz do not constitute AI in the complex technical sense, their use represents the adoption of educational technologies based on algorithms that can adjust question difficulty levels, track student performance, and provide real-time analysis of results. Within the deep learning framework, such strategies contribute to fostering active student engagement, reinforcing understanding through meaningful repetition, and supporting learner-centered education (Ayu, 2024).

Furthermore, these applications also encourage both independent and collaborative learning. Students can access exercises individually outside of class time or participate in group quizzes in class, which stimulate discussion and collective reflection. Thus, the integration of Kahoot, Quizizz, and similar platforms reflects an initial step toward the digitalization of Arabic language learning that is consistent with the principles of deep learning—learning that focuses not merely on final outcomes but on the process of constructing understanding in an active, reflective, and contextual manner (Rissi & Sinaga, 2025).

Despite the gradual implementation of various deep learning–based strategies in several Madrasah Aliyah, teachers face a number of complex challenges in optimizing their application. One major challenge is the limited conceptual understanding of the deep learning approach itself. Some teachers still interpret it superficially as merely "active learning," without internalizing the essential principles of meaningful, mindful, and joyful learning that constitute its foundation (Adnyana, 2024). As a result, learning strategies such as group discussions or student presentations often tend to be carried out procedurally, rather than being used as instruments for deep meaning-making.

These findings are consistent with Transformative Learning theory, which emphasizes the importance of critical reflection in meaningful learning. In the deep learning context, teachers should not only deliver material but also facilitate learning experiences capable of transforming students' ways of thinking at a deep level (Hardika et al., 2020). However, in practice, not all teachers possess the pedagogical competence required to sustain such processes.

A lack of professional development opportunities further hinders progress. Teachers have not yet received sufficient mentoring or systematic training in designing learning activities that promote higher-order thinking skills such as analytical thinking, evaluative judgment, and creative problem solving. The heavy administrative workload and additional responsibilities in madrasah present additional burdens that limit teachers' time for planning reflective and contextual learning (Nurlailah & Julkifli, 2025). In this regard, the Technological Pedagogical Content Knowledge (TPACK) framework becomes relevant, as it emphasizes the balanced integration of content, pedagogy, and technology in designing 21st-century learning experiences (Santos & Castro, 2021). Unfortunately, many teachers still separate these three aspects due to the lack of integrated training.

These challenges are exacerbated by unequal technological infrastructure across madrasah, particularly in non-urban areas. While applications such as Kahoot, Quizizz, or Google Classroom have been introduced, the lack of devices, limited internet access, and low digital literacy among both teachers and students remain significant practical obstacles (Ramadhan et al., 2025). Research by Pebriana et al. (2025) shows that teachers' digital competence strongly influences the quality of technology integration in deep learning–based instruction. Without adequate digital readiness, deep learning risks becoming a mere pedagogical slogan without real implementation.

In addition, the shift from teacher-centered approaches to learner-centered models faces substantial cultural resistance. Some students are not yet accustomed to actively participating, thinking critically, or expressing opinions in open discussions or class presentations. In contexts where hierarchical and authoritative cultural norms remain strong, teachers often serve as the sole source of truth in the classroom, making it difficult to build democratic and participatory learning environments. According to Sociocultural Learning theory, social interaction and supportive environments are essential for knowledge construction (Ku et al., 2015). Thus,

teachers must address this cultural resistance gradually by creating safe and inclusive learning spaces that allow students to take active roles in the learning process.

Meanwhile, assessment systems that are still dominated by objective tests and lower-order thinking skills (LOTS)–based evaluations also make it difficult for teachers to assess learning achievement holistically. Project-based assessment, reflective assessment, and authentic assessment have not been fully adopted as part of the formal evaluation system in most madrasah. This contradicts the principle of constructive alignment, which states that assessments should be aligned with learning objectives and deep learning activities. If assessments continue to measure memorization alone, the deep learning approach will be unable to achieve its goals comprehensively (Mulyaningsih et al., 2025).

Therefore, the challenges teachers face are not only technical but also structural, cultural, and conceptual in nature. Addressing these issues requires comprehensive professional training programs, equitable technological infrastructure development, changes in assessment paradigms, and supportive policies that allow teachers to innovate without being hindered by excessive administrative burdens.

Practical Implications and Educational Policy Recommendations

The findings of this study indicate that the implementation of deep learning in Arabic language instruction at Madrasah Aliyah holds substantial potential for fostering meaningful, reflective, and contextual learning. The practical implications of these findings highlight the need to enhance teachers' capacity to understand and apply deep learning principles both conceptually and pedagogically. Teachers should be encouraged to design learning activities that engage students in higher-order thinking processes, such as critical discussions, project-based problem solving, and reflective presentations integrated with authentic linguistic contexts.

The use of educational technologies such as Kahoot, Quizizz, and other digital platforms has also proven effective in strengthening material retention and increasing student motivation; therefore, their integration into instructional strategies should be implemented in a more systematic manner. Furthermore, madrasah need to cultivate a learning culture that supports learner-centered approaches, in which students are given the space to explore ideas, collaborate, and construct understanding through direct and authentic learning experiencesTop of Form.

To ensure that these practices can be implemented consistently and sustainably, structured educational policy support is required, encompassing: (1) continuous teacher training and mentoring programs based on the integration of pedagogy, content, and technology in line with the TPACK framework; (2) adjustments to the Arabic language curriculum to place greater emphasis on the development of critical thinking, communication, and digital literacy competencies; (3) equitable provision of technological infrastructure and internet access, particularly in non-urban areas; (4) reform of learning assessment systems by prioritizing authentic and formative assessments aligned with the principles of constructive alignment; and (5) institutional policies that provide space for teacher innovation through the simplification of administrative burdens and support for teacher collaboration within professional learning communities.

Through a combination of pedagogical readiness, resource availability, and progressive, contextually responsive policies, the transformation of deep learning–based Arabic language instruction can be realized effectively and equitably across Madrasah Aliyah.Bottom of Form

CONCLUSSION | خاتمة

This study demonstrates that the application of a deep learning approach in Arabic language instruction at Madrasah Aliyah holds significant potential in shaping meaningful, reflective, and contextual learning processes. The identified instructional strategies—such as critical discussions, problem solving, Project-Based Learning (PjBL), student presentations, and the use of digital-based educational technologies—reflect tangible efforts by teachers to integrate deep learning principles into teaching practices.

Nevertheless, the findings also reveal several challenges in its implementation, including limited conceptual understanding of deep learning among teachers, a lack of sustained professional training, technological infrastructure constraints—particularly in non-urban areas—and cultural resistance to participatory and learner-centered approaches. Furthermore, the current learning assessment system, which is still dominated by objective tests and memorization-based evaluations, has yet to fully support a deep learning approach that emphasizes higher-order thinking processes and students' emotional engagement.

In practical terms, the findings recommend strengthening teachers' pedagogical capacity through structured training programs that integrate content, pedagogy, and technology in line with the TPACK framework; revising the Arabic language curriculum to place greater emphasis on 21st-century competencies; and improving learning assessment systems through the adoption of authentic and reflective assessments. Institutional policy reforms are also essential to allow greater room for teacher innovation, including reducing administrative burdens and strengthening professional learning communities.

While this study makes an important initial contribution, several limitations should be noted. The research was conducted in five purposively selected Madrasah Aliyah, and thus may not fully represent the diversity of madrasah conditions in Indonesia. In addition, the descriptive qualitative design did not measure the quantitative impact of instructional strategies on student learning outcomes.

Future research should employ broader and more methodologically rigorous approaches, such as quantitative studies, mixed-methods research, or longitudinal studies that can track sustained changes over time. Classroom action research would also be valuable for testing the effectiveness of deep learning–based instructional strategies in real classroom contexts, while comparative studies could offer insights into factors influencing successful implementation across varied institutional conditions. In this way, the transformation of deep learning–based Arabic language instruction can be advanced more systematically through synergy between theoretical reinforcement, practical innovation, and progressive, context-responsive educational policy support.

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