

## Implementation of Deep Learning Approach in Learning Innovation at Madrasah Ibtidaiyah Negeri 8 West Aceh

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### ABSTRACT

This study aims to examine deep learning-based learning innovations at MIN 8 Aceh Barat using a descriptive qualitative approach and data triangulation method. Data were collected through interviews, observations, and documentation to obtain a comprehensive picture of teachers' understanding, learning implementation, and obstacles in applying deep learning. The results show that teachers understand deep learning as an approach emphasizing in-depth conceptual understanding, active student engagement, and the development of critical and creative thinking skills. However, its classroom application remains uneven due to limited formal training and varying teacher competencies. Many teachers are self-taught, resulting in inconsistent implementation. MIN 8 Aceh Barat has provided various learning media that support interactive and meaningful learning. The madrasah also plans technical guidance (bimtek) programs on deep learning, artificial intelligence (AI), and coding through the Teacher Working Group (KKG) and Subject Teacher Working Group (MGMP) forums to enhance teacher capacity. This study provides a novel contribution by highlighting the contextual challenges and readiness of Islamic educational institutions in implementing deep learning, emphasizing the urgent need for structured and sustainable training to strengthen pedagogical innovation in the era of digital transformation.

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## INTRODUCTION

Education is the primary asset for shaping and helping generations face various challenges in the future. Entering the 21st century, the world of education is confronted with very rapid changes due to technological advances, globalization, and social dynamics. Twenty-first century education emphasizes critical thinking, creativity, collaboration, communication (4C) skills, and the ability to adapt to change (Feri, M., Ismiati, N., Rahmawati, W., & Akbar, 2025). These changes require the education system to focus not only on knowledge transfer but also on developing competencies relevant to the needs of the times (Zebua, 2025). In line with this, learning as the core of the educational process has also undergone many changes. Now, learning must be designed to be more active, meaningful, and oriented toward solving real problems. Students are required to be more actively involved and think critically, so learning models must be adapted not only to pursue material completion but also to foster higher-order thinking skills (HOTS).

One approach relevant to the learning currently being developed is deep learning, proposed by the Minister of Basic and Secondary Education (Mendikdasmen) Abdul Mu'ti. Deep learning is a

learning approach that emphasizes deep understanding, critical thinking, and higher-order thinking skills through active and meaningful learning processes (Ardiansari, L., Jannah, F., & Ma'rifah, 2025). Deep learning in the educational context does not only refer to artificial intelligence technology but more to a learning model that focuses on student involvement in exploring, understanding, and applying concepts deeply (Retnosari, I. E., Ladyawati, E., Hanindita, A. W., & Azmy, 2025). This approach aims to reform conventional learning patterns that usually emphasize memorization and repetition into a constructive and reflective learning process. In this approach, students are encouraged to be involved emotionally and cognitively and are expected to be able to connect the knowledge obtained with solving real problems while developing analytical and creative thinking abilities. This is similar to the concept of mindful learning proposed by (Ragoonaden, 2015), which is important in ensuring that students not only understand material theoretically but also connect it with personal experiences and real-life contexts. Therefore, the deep learning approach, which emphasizes meaningful and conscious learning experiences, becomes very relevant to be applied in the context of education in Indonesia.

The deep learning approach holds tremendous potential, in line with the current tendency in the world of education to increasingly focus on individualistic and contextual learning for students. In various countries, the implementation of deep learning has shown real success, with significant improvements in concept understanding and student involvement in the learning process (Biggs, J. B., Tang, C. S., & Kennedy, 2022). This strengthens the belief that deep learning can be an effective strategy to encourage better quality education.

However, despite the promising potential offered by deep learning, challenges in its implementation cannot be ignored. Various factors that can be challenges include infrastructure, curriculum adaptation, and educator readiness. In implementing innovative learning based on deep learning, educators are required not only to master teaching materials but also to be able to design deep and meaningful learning experiences for students (Suwandi, Putri, R., 2024). In line with this view, (Sucipto, 2022) reveals that the application of deep learning in formal educational environments still faces a number of challenges, such as low teacher understanding of this matter, limited supporting facilities, and lack of appropriate training.

Nevertheless, some educational units are beginning to show initiative to implement this approach more seriously. One concrete example can be found at MIN 8 Aceh Barat, an elementary school that has taken progressive steps in implementing deep learning (Budhiarti, Y., Mytra, P., & Slow, 2025). The implementation of deep learning at MIN 8 Aceh Barat is carried out as part of efforts to improve the quality of education in the madrasah while serving as a model for implementing this approach at the elementary education level.

This initiative is motivated by the school's awareness of the importance of deep and meaningful learning for students and is supported by teachers who generally demonstrate competence and commitment in adopting this new approach. Teachers at MIN 8 Aceh Barat are considered to have pedagogical and technical readiness to implement deep learning in the learning process, which is one of the main reasons this madrasah dares to take this innovative step (Atmojo, I. R. W., Muzzazinah, M., Ekawati, E. Y., Triastuti, R., Isnantyo, F. D., Sukarno, S., & Ramadian, 2025). In this regard, this research will focus on the implementation of deep learning at MIN 8 Aceh Barat, with the aim of identifying how this approach is carried out and the challenges faced in the implementation process.

Based on the above description, the researcher will further examine learning innovations based on deep learning at MIN 8 Aceh Barat. The urgency of this research lies in the importance of finding a deep learning implementation model that suits the characteristics of madrasah so that it can become a concrete example of implementing 21st-century learning in Islamic elementary educational institutions. This research also has an element of novelty because it examines the implementation of deep learning in the context of madrasah education, which has rarely been researched so far, especially in the Aceh region. The research results are expected to provide practical contributions to improving the quality of learning and serve as a reference in developing innovative pedagogical strategies aligned with the vision of national education and Islamic values.

## RESEARCH METHODS

This research uses a descriptive qualitative approach aimed at describing in-depth the implementation of learning innovations based on deep learning at MIN 8 Aceh Barat. This approach was chosen because it is capable of providing a comprehensive and contextual picture of the phenomenon being studied. Research subjects consist of six teachers who implement deep learning-based learning, the madrasah principal, and the vice principal for curriculum affairs. Subject selection was carried out purposively with the consideration that the participants are directly involved in the planning, implementation, and evaluation processes of this innovative learning. The research location is at MIN 8 Aceh Barat, which was chosen because this madrasah has become one of the educational units that implements the deep learning approach as part of efforts to improve learning quality.

Research data were collected through direct observation of the learning process in classrooms, in-depth interviews with teachers, the madrasah principal, and the curriculum vice principal, as well as documentation studies of Lesson Implementation Plans (RPP), learning modules, and student learning outcomes. The obtained data were then analyzed using thematic analysis techniques with the steps of data reduction, data presentation, and conclusion drawing as proposed by (Najmah, Adelliani, N., Sucirahayu, C. A., & Zanjabila, 2023). The analysis process was carried out by identifying, grouping, and interpreting the main themes that emerged from field data. To ensure data validity, source and technique triangulation were used, and member checks were conducted by confirming findings with participants. This approach is used to ensure that the resulting interpretation truly reflects actual conditions (Husnullail, M., Risnita, Jailani, M. S., 2024). Through this method, the research is expected to be able to provide a comprehensive picture of deep learning-based learning practices at MIN 8 Aceh Barat along with the challenges and opportunities faced in its implementation.

## FINDINGS AND DISCUSSION

This research aims to identify learning innovations based on deep learning at MIN 8 Aceh Barat, based on teachers' and curriculum vice principal's perceptions of the application of deep learning within the framework of deep learning. Based on the results of in-depth interviews with several informants, the following findings were obtained:

### A. Implementation of the Deep Learning Approach at MIN 8 Aceh Barat

The implementation of the deep learning approach at MIN 8 Aceh Barat is a strategic step aligned with the demands of the 21st-century curriculum while triggering various innovations in learning practices at the madrasah. Although not all teachers fully understand the concept of deep learning, a number of teachers actively develop learning methods in accordance with deep learning principles (Jayawardana, 2025). This reflects an innovative spirit that continues to grow within the madrasah environment to improve overall learning quality. With this approach, teachers not only implement learning models but also actively serve as facilitators who guide students to collaboratively discover and solve problems meaningfully (Ramadan, Z. H., Putri, M. E., & Nukman, 2025). In its implementation, deep learning is an innovation in learning. Based on data collected in the application of deep learning-based learning, one innovation is that teachers act as facilitators because this has not yet been fully implemented at MIN 8 Aceh Barat. Here are some innovations from deep learning:

#### 1. Meaningful Learning

Deep learning emphasizes deep conceptual understanding that can be connected to students' daily lives (Maulidya, S. R., Insani, S. U., 2025). At MIN 8 Aceh Barat, teachers strive to relate learning materials to students' real contexts, as shown in the interview results with Z (2025) as a teacher at MIN 8 Aceh Barat:

"In mathematics learning, there is material on fractions and ratios, so I first relate the concepts of fractions and ratios to students' daily lives. When students understand what ratios and fractions really are, then students not only know but learning becomes

meaningful for students so they know when these concepts can be used in their daily lives.”

Based on the interview results conducted, the author believes that the implementation of deep learning-based learning at MIN 8 Aceh Barat reflects teachers' commitment to realizing meaningful and contextual learning processes. Teachers' efforts to relate teaching materials, such as fraction and ratio concepts, to students' real-life situations show that learning is not only oriented toward mastering factual knowledge but also toward developing conceptual understanding and higher-order thinking abilities.

## 2. Joyful Learning

The learning methods implemented at MIN 8, such as project-based learning (PBL), jumpstart project-based learning (PJBL), experiments, and group learning, create an interactive and enjoyable learning atmosphere. Students are not only passive recipients of material but actively participate, discuss, and work together in groups, so their motivation and enthusiasm increase. This process builds a positive and engaging learning environment, in accordance with the principles of joyful learning (Caesarani, S., Safira, S. M., Mardiyansah, E., Rizki, M., & Ruslan, 2022).

## 3. Mindful Learning

Mindful learning emphasizes students' full awareness of the learning process, including critical reflection on what has been learned and how to apply it. At MIN 8 Aceh Barat, teachers try to provide space for student reflection, although this still needs strengthening to be more consistent and deep. For example, after experiment or project activities, students are invited to evaluate their learning outcomes through discussions or self-assessments that stimulate critical thinking. In addition, learning is also directed to foster social and environmental awareness, such as love for others, love for the environment, and spiritual values aligned with the love-based curriculum from the Ministry of Religious Affairs (Dinata, F. R., Kuswadi, A., Sutomo, E., & Wulandari, 2025). Teachers facilitate deep questions that encourage students not only to receive information passively but also to connect learning concepts with real life and moral values. Based on interview results with Mrs. Y (2025) as a teacher at MIN 8 Aceh Barat:

“In my opinion, the deep learning approach includes what is called awareness, and now at the Ministry of Religious Affairs, there is already a Love-Based Curriculum. So what is meant by awareness is being able to know and be aware of learning material related to what exists in their lives, then we relate it again to love for others, love for Allah, love for the environment, and so on. There are 3 main components of deep learning, and this awareness fits into that. In this way, students can develop better self-awareness, metacognitive abilities, and emotional management skills during the learning process while building caring attitudes toward the environment and others.”

Based on the interview results conducted, it can be seen that the implementation of mindful learning at MIN 8 Aceh Barat shows teachers' awareness of the importance of reflective and affective aspects in the learning process. This approach not only emphasizes cognitive mastery of material but also the formation of self-awareness, empathy, and students' social responsibility. The integration of spiritual and humanitarian values through the Love-Based Curriculum developed by the Ministry of Religious Affairs becomes an important foundation in realizing holistic and character-building learning. By providing space for reflection and facilitating meaningful questions, teachers help students develop metacognitive abilities and full awareness of the meaning of learning in real life. Therefore, the implementation of mindful learning can be viewed as an effective strategy to form students who are not only intellectually intelligent but also emotionally and spiritually mature.

## 4. Collaboration and Partnership in Learning

Group learning becomes the main strategy at MIN 8 to address differences in student abilities and enhance meaningful social interaction. Students who are accustomed to

working together, sharing tasks, and helping each other can create strong learning partnerships. This not only improves learning outcomes but also builds students' social and emotional skills, which are very important in character development (Nabila, N., Kusumawati, Y., & Haris, 2025). This was conveyed in an interview with Mrs. I (2025), one of the teachers at MIN 8 Aceh Barat:

“Usually, because deep learning can run smoothly, in my opinion, it's when students' abilities are the same. But it's impossible for all students' abilities to be the same. So, the strategy is definitely through group learning. Team learning process so that later if there are shortcomings, they can learn with friends.”

Based on interview results at MIN 8 Aceh Barat, it can be concluded that implementing group learning strategies is an effective step in addressing differences in student abilities. Through group activities, students can help each other understand learning materials so the learning process proceeds more optimally. In addition, the reshuffling of group members conducted periodically allows students to mingle and work together with various friends in class, not just with the same group members. This activity also encourages students to be able to work in teams, not be selfish, and establish good relationships with peers. Thus, group learning plays an important role in improving learning quality and learning outcomes in the Madrasah environment.

#### 5. Use of Varied Media and Learning Resources

MIN 8 Aceh Barat already has adequate digital facilities and infrastructure to support learning, especially in digital classrooms. Teachers use various current platforms such as Educaplay, Kahoot, and Quizizz to provide interactive exercises and enjoyable evaluations for students. The use of such current platforms can increase students' interest and learning outcomes and facilitate teachers in evaluating them. This is in line with research by (Ardiansyah, Nugraha, M. L., Wiyanti, E., & Santoso, 2024), which shows that teachers' use of Quizizz has successfully increased student engagement, strengthened material understanding, and increased learning motivation. This is evident in the interview results with Mr. Z (2025), a teacher at MIN 8 Aceh Barat.

“In mathematics learning, I usually use platforms like Educaplay, Kahoot, and Quizizz for student exercises and tests, especially if the teacher wants to create impromptu quizzes or games. Educaplay is very helpful because it has a feature that creates questions by AI. Besides facilitating teachers, this also makes learning more interesting for students because exercises or tests no longer seem intimidating.”

Based on the interview results, it can be concluded that MIN 8 Aceh Barat has adequate digital facilities and infrastructure to support the learning process, especially in digital classrooms. The use of various current platforms such as Educaplay, Kahoot, and Quizizz allows teachers to provide interactive exercises and more interesting evaluations for students. These platforms not only facilitate teachers in creating quizzes and learning games but also increase students' interest, engagement, and learning outcomes. Thus, the effective use of digital technology supports a more interactive, enjoyable, and productive learning process at MIN 8 Aceh Barat.

Overall, MIN 8 Aceh Barat not only implements the deep learning approach but also presents real innovations in aspects of planning, implementation, and development of learning media. These various innovations prove that the madrasah continues to strive to create more meaningful, interactive, and relevant learning processes for students while strengthening its position as an adaptive and progressive educational institution in the current era of educational transformation.

#### B. Opportunities and Challenges of the Deep Learning Approach at MIN 8 Aceh Barat

The implementation of deep learning-based learning at MIN 8 Aceh Barat opens many positive opportunities that can improve the quality of teaching and learning processes as well as student learning outcomes. One major opportunity from this approach is its ability to develop

critical thinking skills, creativity, and problem-solving abilities that are very important for facing challenges in the 21st-century era (Arifin, B., & Mu'id, 2024). Here are some opportunities for implementing deep learning at MIN 8 Aceh Barat:

### 1. Increasing Student Independence and Responsibility

At MIN 8 Aceh Barat, teachers encourage students to be active in discussions, exploration, experiments, and group work. Models such as PBL (Problem Based Learning) and PJBL (Project Based Learning) are applied to encourage students to discover and solve problems themselves, which indirectly increases their independence. According to Utama, the implementation of PBL can increase student responsibility because students are trained to manage tasks, formulate plans, and make decisions in the learning process. The implementation of PBL is proven effective in developing critical thinking skills and independent learning in elementary-level students (Asniyati & Kusuma, 2022). As stated in an interview with a teacher at MIN 8 Aceh Barat, Mrs. I (2025).

"In science learning, we usually conduct experiments and students are given worksheets (LKPD) to record the results of experiments they have conducted, then also use models like PBL, PJBL, and group learning with the aim of equalizing student understanding so that there are no more students who learn using memorization methods."

Based on the interview results, it can be concluded that teachers encourage students to be active through discussions, exploration, experiments, and so on. The implementation of learning models such as Problem Based Learning (PBL) and Project Based Learning (PJBL) allows students to discover and solve problems independently, so the learning process not only focuses on memorization but also on concept understanding. Activities such as experiments and the use of Student Worksheets (LKPD) help equalize student understanding and develop critical thinking skills and independent learning (Nafi'ah, J., & Faruq, 2025). Thus, the implementation of this strategy is effective in increasing engagement, understanding, and learning quality at MIN 8 Aceh Barat.

### 2. Increasing Student Interest and Active Participation

Teachers at MIN 8 Aceh Barat mention that students appear more enthusiastic when learning is conducted with contextual and enjoyable approaches. They actively ask questions, discuss, and work together in completing tasks. Joyful learning can build an active, creative, and participatory classroom atmosphere, thus having a positive impact on student learning motivation. Joyful learning-based learning can also increase students' interest and active participation because an enjoyable learning atmosphere creates a sense of safety and comfort. As stated in an interview with Mrs. R (2025), a teacher at MIN 8 Aceh Barat.

"In classroom learning, teachers must create an enjoyable learning atmosphere, for example by using an LCD projector to make it easier for students to see things related to the material without having to imagine, so that learning becomes more enjoyable and increases students' interest in learning."

From interviews and observations at MIN 8 Aceh Barat, it is evident that joyful learning-based learning makes students more enthusiastic in following learning, actively discussing, asking questions, and working together in completing tasks. An enjoyable classroom atmosphere and the use of supporting media, such as LCD projectors, help students understand material more clearly, create a sense of comfort, and increase learning interest. Thus, joyful learning becomes an important strategy to make learning more interactive and engaging.

### 3. Encouraging Teacher Innovation in Designing Learning

Teachers at MIN 8 Aceh Barat demonstrate high creativity, such as designing experiment-based worksheets (LKPD), compiling HOTS and contextual-based teaching modules, and utilizing interactive media although not all are optimal. Lestari (2021) states that the deep learning approach requires teachers not only as instructors but also as

designers of learning experiences 1. As conveyed by Mrs. E (2025) as Curriculum Vice Principal:

“In implementing deep learning-based learning, teachers must innovate a lot, mastery of teaching materials must be adapted to enjoyable methods for students, so it is hoped that with this method, learning objectives can be more beneficial and directly received by students. Besides students being able to understand the material, the classroom atmosphere is also enjoyable so it can be memorable learning in their memory.”

From interviews and observations at MIN 8 Aceh Barat, it is evident that teachers are actively innovating in deep learning-based learning. They design experiment-based worksheets (LKPD), HOTS and contextual-based modules, and use interactive media to support the learning process. This innovation not only helps students understand material but also makes learning more enjoyable and memorable. With a creative approach, teachers are able to make learning more effective and easily remembered by students.

#### **4. More Contextual and Socially Valuable Learning**

At MIN 8 Aceh Barat, learning materials are not only directed to achieve cognitive goals but also touch upon life values, such as love for the environment, love for others, and love for God. This learning is aligned with meaningful and mindful learning approaches. Fitriyani & Supriyadi (2023) mention that when learning is related to life values and social contexts, students more easily understand material and are motivated to learn. Meaningful learning that connects material with real life can build students' self-awareness and strengthen character values.

Based on observations at MIN 8 Aceh Barat, it can be seen that learning materials are designed not only to achieve cognitive goals but also to instill life values such as love for the environment, love for others, and love for God, as well as strengthen self-awareness and character.

#### **5. Utilization of Digital Technology that Supports Learning Engagement**

Teachers at MIN 8 Aceh Barat already use various media such as Educaplay, Kahoot, and Quizizz in digital classrooms. This makes the learning process more varied, interactive, and enjoyable. The integration of digital technology in learning can increase student engagement, accelerate material understanding, and create enjoyable learning experiences. Digital platforms encourage interactivity and allow teachers to provide real-time feedback.

However, behind these great opportunities, there are also challenges that must be faced in implementing deep learning-based learning at MIN 8 Aceh Barat, including:

##### **a) Differences in Student Abilities and Readiness**

Some students are still accustomed to traditional memorization methods, so they have difficulty following learning processes that demand active involvement and deeper thinking. In addition, learning time management is also important because deep learning requires sufficient time for comprehensive exploration, reflection, and collaboration processes (Halimah, Utama, G. N., Ningsih, D. N., Saepuloh, A., Nasihin, D., Dahibu, A. D., Firjatullah, F., & Saputra, 2025).

##### **b) Differences in Teacher Abilities**

Teacher ability remains an important factor in ensuring smooth learning processes even though facility infrastructure at the madrasah is adequate, including digital classrooms and wifi access, availability of interactive learning media, and technology support at MIN 8 Aceh Barat. There has been no comprehensive formal training, so understanding and application of deep learning still vary among teachers. As stated in an interview with Mrs. W (2025) as a teacher at MIN 8 Aceh Barat.

From what I've observed at MIN 8 Aceh Barat, teachers' abilities to understand deep learning still vary. There are several teachers who already understand quite well and continue to try to develop themselves, but there are also those who are still unfamiliar because this approach is indeed new and understanding is not yet evenly distributed. Some teachers learn on their own because of interest and curiosity, not because there is training

from the madrasah, that's the reason why each teacher's level of understanding is different. So the implementation is also different.

Based on the interview results, it is known that at MIN 8 Aceh Barat, facility infrastructure to support learning, including digital classrooms, wifi access, and interactive media, is already quite adequate. However, teacher ability remains the main factor for smooth learning processes. From observations and interviews with teachers at this madrasah, it is evident that teachers' understanding of deep learning still varies.

Several teachers already understand quite well and are actively trying to develop themselves, while others are still unfamiliar because this approach is relatively new and there has been no comprehensive formal training from the madrasah. Some teachers learn on their own because of curiosity and personal initiative, so the level of understanding and application of deep learning among teachers also varies (Afwan, B., Putra, A. D., Abbas, N. A., & Fadli, 2025).

c) **Lack of Deep Understanding of the Deep Learning Concept**

Teachers feel that the term deep learning is just a new name for an approach that has been implemented for a long time, such as PAIKEM. This causes initial resistance and confusion in its application. According to Rachmawati (2022), changes in terms in educational policy often cause confusion if not accompanied by comprehensive explanations. Shallow understanding of new curriculum terms can cause resistance and misconceptions (Astuti, R., & Rachmawati, 2022). Interview results with the madrasah vice principal, Mrs. E (2025):

"Many teachers here think that deep learning is the same as PAIKEM, when actually there are differences and distinct innovations in the deep learning approach. Because of that assumption, teachers sometimes become confused when trying to apply it, especially since every new approach always brings new things that must be followed and adapted."

Based on interview results with the madrasah vice principal at MIN 8 Aceh Barat, many teachers initially considered deep learning the same as the old approach, PAIKEM. In fact, this approach has its own differences and innovations that need to be understood and applied appropriately.

This assumption sometimes makes teachers confused when trying to apply it, especially because every new approach always brings additional methods and strategies that must be followed and adapted. This shows that teachers' understanding of new curriculum terms and concepts greatly determines the smooth implementation of classroom learning (Nurhasanah, S., Sutiana, D., Nabil, F., Fauji, I., & Hendriyan, 2024).

Thus, understanding these opportunities and challenges, the madrasah is expected to design appropriate strategies to optimize the implementation of deep learning-based learning (Akmal, A. N., Maelasari, N., 2025). In this way, they can continue to improve education quality while equipping students with relevant and useful competencies for the future.

### C. Supporting and Hindering Factors

In implementing deep learning-based learning at MIN 8 Aceh Barat, there are a number of supporting factors that greatly help smooth this process. Here are some supporting factors in implementing deep learning-based learning at MIN 8 Aceh Barat.

#### 1. Teacher Commitment and Creativity

Teachers at MIN 8 Aceh Barat, despite lacking formal training, show high initiative by learning independently and sharing with each other. This is evidenced in an interview with Mrs. E (2025), as curriculum vice principal at MIN 8 Aceh Barat:

"Regarding deep learning, teachers learn individually, for example, if there are problems, they later sit down to form small groups to discuss those problems."

Based on the interview results above, it can be concluded that although teachers at MIN 8 Aceh Barat have not received formal training related to implementing deep learning, they still show high spirit and initiative to learn independently and share experiences through small groups. This attitude of mutual support and willingness to continue learning is evidence that training limitations do not always become obstacles for teachers to develop. With collaborative spirit and independent learning, the implementation of deep learning at the madrasah has great potential to develop better in the future.

## 2. Availability of Digital Media and Contextual Modules

MIN 8 Aceh Barat has provided digital media and teachers use learning platforms such as Kahoot and Educaplay that facilitate teachers and students in conducting interactive learning. This supports mindful learning by giving students space for reflection and active involvement. In addition, the use of interactive learning media and various diverse learning resources can also enrich students' experiences and support deep learning.

## 3. Curriculum Support and Madrasah Training Plans

The existence of a new curriculum that adopts deep learning becomes a framework for teachers. The madrasah has also planned technical guidance (bimtek) as an effort to increase teacher capacity evenly. As stated by Mr. G (2025) as madrasah principal.

"From the madrasah side, we usually provide technical guidance (bimtek). This is indeed already planned for this month, we are already planning to conduct bimtek about the deep learning approach in the form of AI and coding. One form is like in the form of Teacher Working Groups (KKG), in the form of Subject Teacher Working Groups (MGMP) for religious teacher majors."

Based on the interview results, it is evident that the madrasah also shows support by planning technical guidance (bimtek) to increase teacher capacity evenly, including through KKG and MGMP activities, as well as deep learning practice training using AI and coding. This shows that the madrasah strives to facilitate teachers so they can understand and implement the deep learning approach better.

However, it cannot be denied that there are several obstacles that become hindrances in implementing this deep learning-based learning, namely as follows:

### a) Limited Formal Training for Teachers

The lack of systematic training opportunities causes uneven understanding and application of deep learning among teachers. As stated by (Nurhidayati, Pangestika, R. R., Purwanto, J., Hadi, I. S., & Cahyani, 2025), teacher training and professional development are the main keys to successful learning innovation. As stated in an interview with the Madrasah Principal, Mr. G (2025).

"The lack of information provided to teachers and madrasahs is a major obstacle. The government has changed the curriculum, including changing the approach but not providing training. So automatically all teachers, whether they want to or not, understand or don't understand, must implement the curriculum and approach without any reference. What exists are mostly guides. If practical training directly in the field has never existed. That's where the obstacle is. So that's why sometimes the expected goals are not appropriate, as a result, teachers still have difficulty understanding it, preparing deep learning-based lesson plans, and implementing them optimally in class."

Based on the findings and statements above, it can be concluded that the lack of systematic training opportunities is the main factor in teachers' unpreparedness to understand and apply deep learning-based learning. Although curriculum policy has undergone changes and encourages more innovative learning approaches, without structured training, teachers have difficulty adapting to these demands. This results in misalignment between curriculum goals and learning practices in the field. Continuous training and mentoring are greatly needed so that teachers not only understand the concept of deep learning theoretically but are also able to implement it effectively in the

learning process. Thus, the expected educational transformation can truly be achieved through improving teacher competencies .

b) Large Number of Students in One Class

The quite large number of students in one class makes it difficult for teachers to provide individual attention and facilitate learning processes that require deep interaction and reflection from each student, which is the core of the deep learning approach (Al Ghadafi, 2022). In interview results with one of the teachers at MIN 8 Aceh Barat, Mrs. R (2025).

“What becomes an obstacle in this implementation is because there are so many students, making it difficult to understand each student's diverse character as well as each student's learning style.”

Based on research findings and interviews with teachers at MIN 8 Aceh Barat, it can be concluded that an excessive number of students in one class becomes one of the main obstacles in implementing deep learning-based learning. Crowded classroom conditions make it difficult for teachers to provide individual attention and understand each student's character and learning style. In fact, the success of the deep learning approach greatly depends on teachers' ability to facilitate deep interactions, reflection, and personal understanding of students. The implementation of deep learning will be more effective if the ratio of teachers and students in class is balanced. That way, teachers have sufficient time and opportunity to recognize each student's potential and adjust learning approaches so that deep learning goals can be achieved optimally.

c) Teachers' Initial Response

Many teachers feel pressured and have difficulty adapting to this quite complex new method, especially due to minimal training and formal support. This phenomenon aligns with what is stated by (Bagea, I., Ririk, Bagea, A., Rahmadani, P., Azzahra, N. A., Ulfia, B. A., Herlianti, Anita, N., Gasani, R. A., & Amalia, 2025) that changes in the education system often cause resistance and adaptation difficulties among educators. As stated in an interview with Mrs. E (2025), curriculum vice principal at MIN 8 Aceh Barat.

“The first response from teachers is definitely stress. Teachers, when there are new curricula and approaches, all get stressed first, before seeing what the form is like. If there's already new terminology, they haven't looked into it yet but already think it's difficult. That indeed always happens in the field. So because the response is like that, sometimes understanding it is also hindered, difficult to understand, difficult to find out. Because in the first thought, it's already difficult, oh no, a new curriculum again.”

Based on the interview results, it can be known that the biggest challenge in implementing deep learning lies not only in technical aspects but also in teachers' mental readiness and attitude in facing changes. Fear and stress that arise due to curriculum changes show the need for continuous mentoring and training strategies. With adequate support, teachers will be more confident and open to adapting to new learning methods so that the implementation of deep learning can run better and in accordance with expected educational goals.

#### D. Evaluation of the Deep Learning Approach

The evaluation of implementing deep learning-based learning at MIN 8 Aceh Barat shows significant progress in planning and implementing learning processes oriented toward active student engagement. Based on observation results, some teachers have compiled teaching modules containing learning objectives focused on Higher Order Thinking Skills (HOTS), contextual approaches, and reflective activities that support meaningful learning. This aligns with deep learning principles that emphasize the connection of concepts with students' real experiences. The implemented learning process shows varied and innovative strategies, such as

discussions, exploration, projects, and case studies, which consistently activate students' cognitive and emotional engagement. Collaborative activities in groups become one effective method that encourages students to exchange ideas and build knowledge together, aligning with (Soro, S. H., Suherman, M., Abuy, & Masrukoyah, 2024)'s opinion on problem-based and collaborative learning.

Reflection provided at the end of the learning process has also begun to be implemented, although it still needs improvement to be more consistent and deep as part of learning. From the aspect of media and learning resources, teachers have utilized various interactive media relevant to the learning context, thus supporting more interesting and applicable learning processes. However, evaluation results also show that learning assessment still focuses more on final results. Meanwhile, assessment of learning processes and students' deep understanding still needs to be improved so that deep learning goals can be achieved well.

Overall, this evaluation shows that the implementation of deep learning-based learning at MIN 8 Aceh Barat has reached a positive stage with various innovations in learning strategies and student engagement. Nevertheless, there is room for improvement in aspects of student reflection and comprehensive assessment so that the learning process can run more optimally and in accordance with deep learning goals.

## CONCLUSION

This research examines learning innovations based on deep learning at MIN 8 Aceh Barat. Research results show that teachers understand the concept of deep learning as an approach that emphasizes deep understanding and active student engagement, but its application is not yet even due to limited formal training and differences in teacher competencies. Some teachers still learn independently, resulting in variations in implementation. The madrasah has taken the initiative to plan technical guidance (bimtek) on deep learning, AI, and coding to increase teacher capacity. These findings confirm the importance of institutional support, structured training, and continuous follow-up so that learning innovations can run effectively. Theoretically, this research provides contributions as an initial model for implementing deep learning in elementary madrasahs, while practically, the results can serve as a reference for other educational institutions in developing meaningful, contextual, and adaptive learning in accordance with 21st-century demands.

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