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UNRAVELING THE ESSENCE OF DEEP LEARNING APPROACH APPLICATION: IDENTIFYING CRITICAL FACTORS FOR EFFECTIVE IMPLEMENTATION IN SCHOOLS

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ABSTRACT

The Deep Learning Approach is increasingly viewed as a valuable educational model for preparing students with crucial 21st-century skills, including critical thinking, creativity, teamwork, and effective communication. Nonetheless, the effective application of the approach is significantly influenced by the specific local context, the capabilities of implementers at various levels, and their understanding and interpretation of Deep Learning concepts and principles. This research seeks to gain in-depth insights into practitioners' experiences and perspectives, as well as the support systems needed to implement a Deep Learning approach in schools in Southwest Aceh. This is a qualitative methodology that uses Focus Group Discussions (FGDs) and interviews as the main methods of data collection, which were later analyzed using NVivo 12 software. The findings indicate that the implementation of Deep Learning remains in its early, fragmented stage, limited to a small number of schools, and primarily focused on preparatory activities such as teacher training, lesson planning, and limited dissemination. The study also reveals divergent stakeholder perspectives: the Education Office assumes a predominantly administrative role; school principals emphasize instructional leadership. At the same time, teachers demonstrate strong enthusiasm, but face constraints related to administrative workload and limited digital literacy. Furthermore, effective implementation requires systemic support, including alignment between national and local policies, strengthened digital infrastructure, and structured, sustained professional mentoring. These findings highlight the importance of context-responsive and system-level support in addressing implementation gaps and enabling effective Deep Learning practices in decentralized education systems.

INTRODUCTION

The Deep Learning approach is increasingly recognized as a promising educational paradigm for equipping students with essential 21st-century skills, such as critical thinking, creativity, collaboration, and communication. In Indonesia, the implementation of this

approach has begun to roll out under the direction of the Minister of Primary and Secondary Education (Hadi, M. S., Setiawan, V., & Hidayah, 2024), which is, of course, driven by the vision of producing graduates who are competent and globally competitive. However, implementing Deep Learning is not a simple, linear process. Moreover, Indonesia has just begun implementing the 2024 Curriculum, and adjustments to the new learning approach pose particular challenges for implementers in the regions (Jannah M, 2023). The success of its implementation is greatly influenced by the local context, the capacity of implementers at various levels, and their understanding and interpretation of the concepts and principles of Deep Learning (Gordon C, Debus, 2002). Although various studies have explored the effectiveness of Deep Learning on students' cognitive achievement (Hadi, M. S., Setiawan, V., & Hidayah, 2024; Siswanto D, 2024; Wijaya AA, Haryati T, 2025), current educational literature in Indonesia is still dominated by studies that focus on pedagogical efficacy in the classroom (Adnyana IKS., 2024; Natsir, 2025).

However, information on how Deep Learning policies is interpreted by policymakers at the regional level, such as the Education Office and school principals, who play a crucial role in the success of systemic implementation, remains underexplored.

This research offers contextual innovation through a study in Southwest Aceh Regency, a unique region that integrates Islamic sharia values into its educational ecosystem. In contrast to previous research, which examined Deep Learning only in limited ways across certain subjects (Lubis M, 2024), this study provides a broader view of the alignment between the central vision and the social, cultural, and administrative conditions in the regions. Furthermore, this study makes a methodological contribution by using Focus Group Discussions (FGDs) with participants from various stakeholder levels. The use of FGD in this context goes beyond the commonly used single interview method because it can spark dialectics and detect diverse perspectives in real-time (Morgan, 2019; Nyumba, T. O., Wilson, K., Derrick, C. J., & Mukherjee, 2018), which allows researchers to identify consensus and differences of opinion among stakeholders (Barbour, 2018). Specifically, this approach also allows researchers to capture the subjective nuances and complexity of change fatigue experienced by teachers in the field, which is often not revealed in macro quantitative studies. (Hadi, M. S., Setiawan, V., & Hidayah, 2024; Siswanto D, 2024; Wijaya AA, Haryati T, 2025).

In a global context, the application of deep learning in education has advanced rapidly, offering great potential for personalizing learning, automating assessments, enabling predictive analytics, and developing intelligent tutoring systems (Holmes W,

Bialik M, 2019). Deep learning enables the development of systems capable of tailoring learning materials and methods to individual students' needs, analyzing learning data to predict the risk of failure, and developing intelligent tutoring systems that provide individualized guidance.

Therefore, the results of this study are expected to inform the specific needs for implementing Deep Learning that is appropriate to regional characteristics.

Furthermore, this study analyzes how Deep Learning can be used to address educational challenges in Southwest Aceh, including limited access to educational resources, disparities in educational quality, and low student participation. This research will also examine the impact of deep learning implementation on student learning outcomes, motivation, and engagement in the learning process. Therefore, understanding the experiences, perspectives, and challenges faced by implementers in the regions through qualitative research will provide crucial information for the successful integration of this deep learning approach into an effective learning process. The research questions are:

1. How has the implementation of the deep learning approach been implemented in schools so far?
2. What are the perspectives of implementers (the Education Office, school principals, and teachers) in supporting the integration of the deep learning approach in schools?
3. What support is needed to support the effective integration of the deep learning approach?

RESEARCH METHODS

This study employed an exploratory qualitative approach, in which data were collected through in-depth interviews and Focus Group Discussions (FGDs). Data collection took place in September 2025. Participants were selected using a purposive sampling technique. Interviews were conducted with three officials from the Southwest Aceh Regency Education Office involved in monitoring and facilitating Deep Learning implementation at the school level.

The FGDs were then conducted in two groups of schools in the early stages of Deep Learning implementation. The first group consisted of teachers from kindergarten, elementary, and junior high schools.

The second group consisted of principals from all three levels of education. This grouping aims to facilitate rich discussions and detect different perspectives directly

(Morgan, 2019; Nyumba, T. O., Wilson, K., Derrick, C. J., & Mukherjee, 2018). A total of 45 participants from both groups participated in the FGD. The principle of data saturation was used to ensure that the desired data were obtained. The data was then analyzed using NVivo12 software. To ensure valid and reliable qualitative data analysis, the researchers used a six-stage thematic analysis as proposed by Braun, V., & Clarke (2006). Internal validity was maintained by testing the consistency of emerging themes across researchers. Two researchers coded independently to minimize the influence of personal bias. The coding results were then validated through discussions with the four-person research team. In addition, the procedure for checking participants involves returning the results of data interpretation to selected participants to ensure their accuracy, thereby reducing errors in understanding the nuances of participants' context (Lincoln YS, 1985).

RESULTS AND DISCUSSION

The results of NVivo 12 thematic analysis revealed 11 subthemes emerging from the transcribed interviews and focus group discussions (FGDs), categorized into three themes: the status of deep learning implementation, the perspectives of implementers on deep learning implementation, and the support needed for effective deep learning implementation.

The NVivo thematic analysis yielded 49 data codes. A presentation of the resulting themes and subthemes is shown in Table 1.

Table 1. Presentation of Themes and Sub-themes Found

Theme	Sub-theme	# raw codes	%
Implementation Status	Implementation stage	3	6.12%
	Scope and Limitations	3	6.12%
	Operational Challenges	5	10.20%
	Methods and Patterns	4	8.16%
	4 Subthemes	**15**	**30.61%**
Implementer's Perspective	Education Office	6	12.24%
	Teacher	5	10.20%
	Principal	5	10.20%
	3 Subthemes	**16**	**32.65%**
Support Needed	Infrastructure	4	8.16%
	Training	5	10.20%
	Load Reduction	4	8.16%
	Policy & Supervision	5	10.20%
	4 Subthemes	**18**	**36.73%**
3 Main Themes	11 Sub-Themes	49	100.00%

The thematic analysis results in Table 1 indicate that the need for systemic support is the most dominant aspect of Deep Learning implementation in the regions, accounting for 36.65% of the total data. This is followed by the implementer perspective, which accounts for 32.65% of the total findings. Meanwhile, the implementation status of Deep Learning integration contributed 30.61%. This distribution indicates that integration challenges lie not solely in operational techniques but also in gaps among policy, implementer readiness, and the need for comprehensive on-the-ground support.

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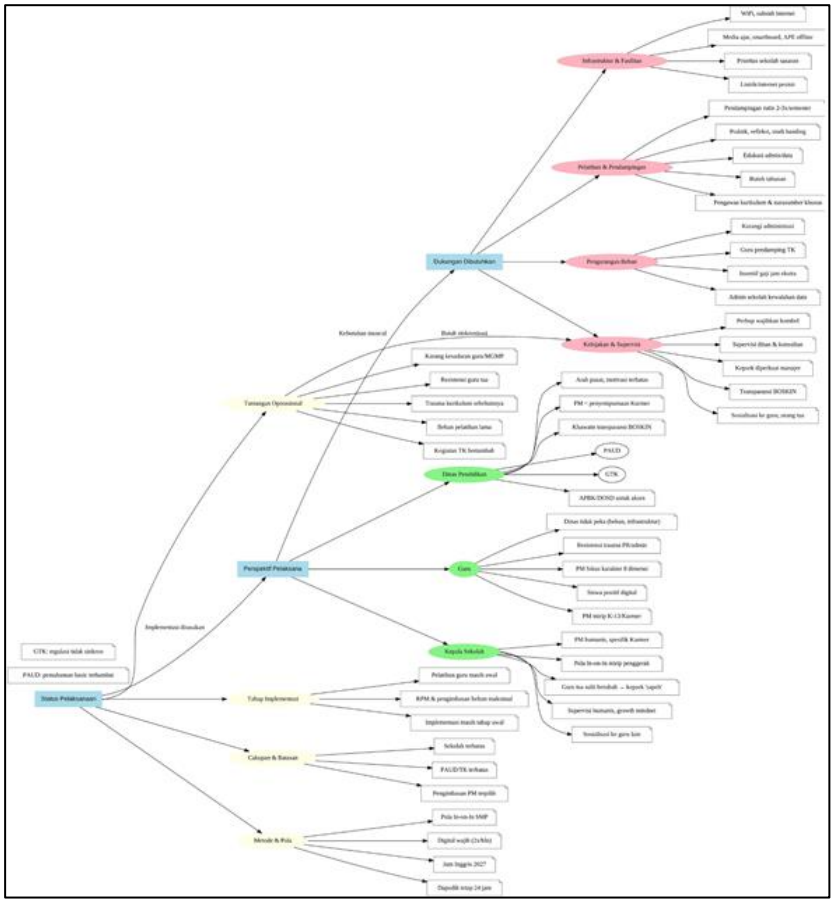

Figure 1: Distribution of Themes in Interview and FGD Data Analysis

To understand the interconnectedness and hierarchy among these main themes within the broader implementation ecosystem, Figure 1 presents a visual mapping that distributes these sub-themes along a path from implementation status and implementer perspectives to the need for systemic support.

Status of Deep Learning Integration Implementation in the Region

Deep Learning integration in Southwest Aceh is still in its early stages and is partial. As stated by Interviewee B, "implementation is still in the learning stage, disseminating information in three schools, with a focus on projects and independent groups, learning communities in Early Childhood Education and Kindergarten." This situation was reinforced by Interviewee A, who stated, "Overall... It can be seen that the integration stage of Deep Learning is still quite low this year." This finding indicates that technical issues not only hamper implementation but also lead to the phenomenon of "Pseudo-Adaptation." In accordance with the argument of Prieto-Flores, Ò., & Miquel-Baldoy (2020), without a shift in pedagogical beliefs, curriculum innovation tends to be adopted only at the administrative level, thus creating an implementation gap, as in the case of Hadi, M. S., Setiawan, V., & Hidayah (2024).

This pseudo-adaptation phenomenon can also have a psychological impact on the school ecosystem. For teachers, this condition can lead to a significant decrease in self-efficacy because they feel compelled to implement the curriculum without adequate conceptual understanding (Isna, N., Asdarina, O., & Nurhaliza, 2025). This impact can also spread to students. Jannah, M., & Isna (2023) argue that curriculum change that is not balanced with teacher readiness in the field directly reduces students' motivation to learn. Students can become subjects experiencing pedagogical uncertainty, in which the classroom environment, which should be a space for in-depth learning and exploration, feels rigid and under pressure from administrative tasks (Vantieghem, W., Roose, I., Gheyssens, E., Griful-Freixenet, J., & Van Avermaet, 2020). As a result, this pseudo-adaptation can widen the gap in learning quality Robinson, V. M., Hohepa, M., & Lloyd (2016), leading students to lose the emotional and cognitive connection to the learning process that should be there (Hattie, 2018).

Perspectives of Deep Learning Approach Implementers

The data in Figure 1 also demonstrates a fragmentation of roles among stakeholders. The Education Office tends to focus on administrative aspects, while principals focus on leadership in learning and teachers are burdened with numerous operational tasks. This imbalance is further reinforced by a teacher's complaint raised in a focus group discussion (FGD): "The high workload hinders the implementation of deep learning because teachers have to scan too many devices" (Teacher FGD, September 2025). The gap between practitioners' enthusiasm for the field and the limitations imposed by bureaucracy underscores the importance of the concept of Contextual-Religious Synchronization. The

integration of the Deep Learning concept in regions with strong socio-cultural characteristics, such as Southwest Aceh, will not be optimal if it relies solely on a uniform, rigid, and secular-technocratic approach (Abdullah, 2018). In practice, the success of this pedagogy is determined by the extent to which the aspects of Deep Learning (collaboration, problem-solving, and critical thinking) can align with the Islamic Sharia values inherent in students' daily lives. This aligns with the principle of culturally responsive pedagogy, in which educational innovation is more effective when it builds on local cultural capital (Aronson, B., & Laughter, 2016). When a new policy is imposed without considering the cultural context, the impact can actually trigger psychological saturation or change fatigue in the school environment, which ultimately becomes a step that must not be ignored to keep local religious identity alive, while also making it the main foundation in building the character and agency of students (Starr, 2019; Tan, 2017).

Support Needs

The findings of this study also identify the urgency of comprehensive, systemic support, including strengthening digital infrastructure, practice-based training, simplifying administrative burdens, and policy synchronization. In terms of policy, there is a gap between the demands of implementing Deep Learning and the operational realities on the ground. Top-down curriculum transformation is often perceived as an additional administrative burden rather than a pedagogical innovation. This was reflected in the focus group discussions (FGDs), where participants expressed that "socialization (of the program) to other teachers (is still perceived) forced and coerced" (FGD with school principals, September 2025). This psychological pattern creates resistance that hinders the transfer of learning, a crucial process for the continued integration of new competencies in the classroom.

This phenomenon is in line with the findings of Vantieghem, W., Roose, I., Gheyssens, E., Griful-Freixenet, J., & Van Avermaet (2020), which show that excessive administrative pressure significantly reduces teachers' pedagogical reasoning. When teachers become overwhelmed by administrative tasks, the innovative vision of Deep Learning loses its relevance. Preston, J. P., Jakubiec, B. A., & Kutsyuruba (2020), adding that educational reforms that do not position teachers as active partners often trigger reform fatigue, a psychological condition that inhibits teachers' desire to experiment in the classroom. To address these challenges, the Bi-directional Reflection model can serve as a reference. This model positions the principal not only as a bureaucratic manager but also as a “contextual

curator" (Fullan, 2016), placing the principal in a position to translate national policies into forms that are relevant and can be implemented in line with reality at the educational unit level. By integrating local values into human supervision, Deep Learning can transform into a living learning culture. Furthermore, Isna (2021) suggests the existence of a supportive ecosystem that goes beyond formal training to facilitate successful learning transfer. This support includes a commitment from school leadership to provide regular spaces for teacher reflection, the availability of infrastructure that enables pedagogical experimentation without administrative pressure, and a learning-community culture grounded in students' real needs. Without an integrated support ecosystem, the impact of training will be short-term and will not lead to lasting changes in teaching behavior. Therefore, the effectiveness of Deep Learning at the district level requires a paradigm shift: from an orientation toward administrative compliance to culturally informed pedagogical autonomy. Sriprakash, A., Martínez-Guzmán, A., & Proctor (2020) emphasize that the effectiveness of education reform depends on school leaders' courage to deconstruct global policies into local contexts meaningful to teachers. By adopting the Bi-Directional Reflection model, schools can mitigate the risk of learning decay (a decline in learning quality after training) and ensure that curriculum initiatives contribute optimally to the continuous improvement of human resources.

CONCLUSIONS AND RECOMMENDATIONS

The implementation of Deep Learning in Southwest Aceh Regency still faces structural challenges, namely the phenomenon of Pseudo-Adaptation, in which pedagogical innovation is often reduced to mere administrative compliance. The gap between the enthusiasm of education practitioners and bureaucratic restrictions triggers resistance and change fatigue among teachers. These findings confirm that the success of transforming learning approaches does not depend solely on technical instructional updates but also requires aligned policies that accommodate local values as the foundation for character development and lifelong learning skills for students. As an intervention, the Bi-Directional Reflection model has shown potential in mitigating learning decay. This model redefines the role of the principal from merely an implementer of bureaucratic control to a contextual curator who provides supportive guidance based on the real needs of teachers and students. Through humanistic clinical supervision and an adequate supporting ecosystem, every curriculum initiative can contribute significantly to improving the quality of Human Resources (HR).

Based on these conclusions, the Ministry of Primary and Secondary Education should ideally recontextualize regulations to expand pedagogical autonomy and reduce the administrative burden on schools. Meanwhile, principals need to shift their leadership orientation from bureaucratic control to humanistic guidance through learning communities based on continuous reflection. For future researchers, evaluating the long-term effectiveness of the Bi-Directional Reflection model across various levels of education can help strengthen the sustainability of learning transfer, which is contextual and rooted in the social realities of local communities.

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