

*International Journal of Learning, Teaching and Educational Research*  
Vol. 24, No. 11, pp. 618-636, November 2025  
<https://doi.org/10.26803/ijlter.24.11.29>  
Received Aug 16, 2025; Revised Oct 8, 2025; Accepted Oct 11, 2025

## Implementation of Deep Learning Pedagogy in Curriculum Reform: Primary School: Teachers' Perspectives in Indonesia

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**Abstract.** Curriculum reform in Indonesia is increasingly emphasizing the integration of deep learning pedagogy. However, its practical implementation in primary schools remains underexplored. This study investigated curriculum reform in Indonesia in relation to a national policy that mandates the integration of deep learning pedagogy in the curriculum delivery. Using a qualitative case study design, this study explored the challenges experienced, capacities demonstrated, and strategies adopted by teachers to facilitate effective implementation. Data were obtained through in-depth interviews with eight purposively selected teachers, supplemented by snowball sampling, which were triangulated through focus group discussions. A thematic analysis conducted using NVivo 12 identified three interrelated themes: implementation challenges, teacher preparedness, and pedagogical strategies. The findings indicate that teachers face substantial constraints, possess limited capacity to operationalize deep learning pedagogy, and require sustained professional development to enhance implementation. The collaborative engagement of primary school teachers constitutes a critical factor in the successful implementation of curriculum reform. These findings underscore that the success of curriculum innovation depends on not only policy directives but also on comprehensive education reform and continuous professional growth of educators, which would enable them to prepare students for future challenges. This study contributes to the literature by presenting empirically grounded and contextually relevant strategies for the Indonesian education system and offering a comparative perspective that has important implications for educators, academic supervisors, and policymakers engaged in curriculum reform.

**Keywords:** curriculum reform; professional development; deep learning pedagogy

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## 1. Introduction

In an increasingly globalized world, curriculum innovation is essential for improving the quality and relevance of education. Curriculum reform is not a one-off event. The Organisation for Economic Co-operation and Development (OECD, 2020) reports there is often a lag between policy design and classroom impact, and effective implementation requires monitoring, evaluation, feedback loops, and continuous improvement.

However, its implementation often presents educators with complex challenges. One of the most pressing issues is the difficulty teachers encounter when they adapt to new pedagogical frameworks, particularly when reforms are introduced without adequate training or institutional support (Zhou et al., 2025). Such challenges can significantly delay the intended progress of educational reforms, thereby diminishing their potential impact on student learning outcomes. Therefore, identifying and addressing the systemic and logistical barriers that hinder successful implementation are crucial.

Research indicates that teacher agency, professional development, and collaborative planning are key to overcoming these obstacles and fostering innovation in practice (Gao & Zhang, 2020). Furthermore, selecting instructional strategies that align with the goals of the innovation and students' learning needs is vital to ensure their effectiveness (López-Pérez et al., 2024). Ultimately, the success of curriculum innovation depends on strategic planning, teacher empowerment, and sustained institutional support. Teachers can meet curriculum reform expectations if they are supported by professional development, strong leadership, and adequate resources (Fullan, 2025; Sinnema et al., 2020).

Ammar et al. (2024) and Aravantinos et al. (2024) emphasize that pedagogical approaches that embed critical thinking and adaptability are pivotal for driving curriculum innovation. In this context, comprehensive teacher preparation serves as a fundamental prerequisite for the successful implementation of curriculum reform in Indonesia. However, this challenge is compounded by classroom practices that involve teachers prioritizing management over higher-order thinking, especially in non-urban schools (OECD, 2020). This phenomenon is particularly evident in countries with cultural characteristics comparable to those of Indonesia.

Curriculum reform has faltered amid administrative formalities, thereby causing pedagogical change to be neglected and classroom learning quality to stagnate (Puad & Ashton, 2023). Neither Indonesia's 2013 Curriculum nor the Merdeka Curriculum has effectively cultivated the students' critical and independent thinking, and most primary school teachers remain at a basic level of understanding and have failed to progress to interpretation or analysis levels (Hidayah et al., 2022). Therefore, this study offers novel empirical insights sought to address the gap in the literature on how deep learning pedagogy is perceived and practiced at Indonesian primary school level.

## 2. Literature Review

Deep learning, in this context, refers to meaningful and enjoyable learning that cultivates conceptual understanding, facilitates cross-domain connections, and promotes real-world application, rather than rote memorization or examination preparation (Wiyono et al., 2025; Fullan et al., 2023). Achieving deep learning requires teacher competence, which is defined as the teacher possessing the knowledge, skills, and behaviors that educators are expected to internalize and demonstrate in discharging their professional responsibilities. A teaching strategy in primary school education is understood to be a deliberate and structured plan that is designed to support learners to attain specific learning objectives.

Research consistently identifies inadequate training, limited resources, and policy practice gaps as enduring barriers to curriculum reform (Darling-Hammond et al., 2023; Fullan et al., 2023). Although randomized trials show that targeted, practice-centered preparation with aligned materials can improve instructional quality in the short term (Gore et al., 2021; Sandgren et al., 2023), such measures rarely succeed at scale. Effective reform requires deliberate capacity building, with teachers emphasizing autonomy, contextual flexibility, collaborative planning, and sustained professional learning (Alisaari et al., 2025; Leshabane et al., 2025; Sinnema et al., 2020). Thus, enduring change depends not only on improved training and resources, but also on systemic coherence and meaningful stakeholder engagement.

Recent Indonesian studies confirm that teacher preparedness and institutional support are decisive for curriculum reform, yet many educators still lack adequate training and resources to apply new pedagogies effectively (Puspitasari, 2024; Subandiyah et al., 2025). Misalignment between revised learning outcomes and the assessment practices complicates implementation further and creates tensions that undermine reform goals (Tatik et al., 2025). Simultaneously, there is evidence that reforms that are grounded in competency-based approaches and inclusive stakeholder collaboration can foster student engagement, strengthen critical thinking, and ease instructional transitions (Martinez et al., 2023). This contrast underscores a significant gap: the conditions that ensure policy aspirations become effective classroom practice remain insufficiently explored, particularly in contexts marked by uneven institutional capacity.

Using a deep learning approach, this study critically examined primary school teachers' perspectives on Indonesia's recent curriculum reforms. Research has often been overly descriptive and has failed to capture the complex realities of classroom-level challenges, capacities, and adaptive strategies (Baharuddin & Burhan, 2025). In particular, the primary school context remains underexplored, despite its distinct resource constraints, uneven competency readiness, and unique learning cultures. By addressing these overlooked dimensions, the present study investigated the challenges, competencies, and strategies that teachers employ to respond to reform, and offers evidence-based insights to strengthen practice, enhance professionalism, and inform policy. Three research questions guided this inquiry:

**RQ1:** What challenges do teachers face when they implement the curriculum with innovative pedagogy?

**RQ2:** How do teachers perceive their competencies in relation to curriculum innovation demands?

**RQ3:** Which strategies do teachers use to strengthen teaching competencies to achieve curriculum innovation?

### **3. Methods**

#### **3.1 Research Design**

A case study design was employed to explore the challenges and strategies associated with implementing the new curriculum. This approach enabled a detailed understanding of the real-world dynamics in specific educational contexts through interviews, observations, and document analysis (Creswell & Poth, 2016). Case studies are particularly effective for capturing the complexity of educational practices and amplifying the voices of teachers as the key actors in curriculum policy implementation (Cohen et al., 2018). The design was well-suited for examining the evolving experiences of teachers in the local education landscape.

#### **3.2 Data Collection**

The study was conducted from January to May 2025. During this time, the Indonesian government was strengthening regulations, expanded outreach, and implemented deep-learning pedagogy in primary schools. In-depth interviews were conducted using a standard set of questions to ensure consistency, while allowing for elaboration and contextual nuances (Jones, 2023; Taherdoost, 2022). The interviews were conducted in Indonesian, with occasional use of the local language. Respondents shared their experiences directly. Each participant was asked the same set of questions, and they had an equal opportunity to respond to them. Each interview lasted 45–68 minutes (mean: 57 minutes), and was recorded with consent at mutually agreed times and locations. Focus group discussions were conducted to validate the interview findings.

#### **3.3 Participants**

Eight teachers representing five primary schools of Cluster 3 in Cina Subdistrict, Bone Regency, South Sulawesi, participated in the study. The researcher's familiarity with the semi-urban context—situated between rural and urban settings—supported contextual understanding during the data collection. The cluster was purposively selected because it represents an official coordination unit in the primary education system, which ensured the applicability of the findings in practice.

Respondents representing diverse classes, schools, and teaching backgrounds provided varied perspectives that enriched the data. When the data collection achieved saturation, it was confirmed that the number of participants was adequate to meet the study objectives (Creswell & Poth, 2016; Guest et al., 2020). NRL was chosen as the first interviewee. She was the most active in providing feedback on deep learning during the teachers' working group sessions.

Respondents were selected through purposive snowball sampling. Snowball sampling starts with an initial participant who was familiar with the study (Naderifar et al., 2017). Subsequent participants were selected on the recommendation of the preceding participant, and this process continued until data saturation was achieved (Parker et al., 2019). That is the point at which no new insights emerged from additional data collection. The relatively small number of participants (N = 8) enabled more extended engagement with each participant, which enabled the researcher to gain deeper insights into their perspectives.

**Table 1: Participant information**

Participant code	Gender	Age (years)	Teaching experience (years)	Class taught	Training (f)	Duration of the interview
NRL	F	56	34	6 <sup>th</sup>	2	52'
AMR	M	59	37	6 <sup>th</sup>	4	68'
HRS	F	57	35	1 <sup>st</sup>	2	48'
RDD	M	57	33	5 <sup>th</sup>	3	64'
ASN	F	42	15	6 <sup>th</sup>	3	55'
AMY	F	50	12	6 <sup>th</sup>	1	45'
HRV	F	56	20	1 <sup>st</sup>	3	58'
SNT	F	58	37	1 <sup>st</sup>	2	66'

The research period was extended to gain deeper insights and achieve data saturation among the participants. During the extension of the research period, the researcher informally and separately met three participants during the school break (AMR, HRS, and AMY). Five other participants were contacted directly via telephone (NRL, RDD, ASN, HRV, and SNT). This was done to ensure that participants' opinions were consistent with those articulated in the preceding interviews.

### 3.4 Data Analysis

Data derived from in-depth interviews and document analysis were systematically examined using the thematic analysis framework proposed by Jowsey et al. (2021). This methodological approach was chosen because of its flexibility for capturing both the explicit and the latent meanings of qualitative data (Braun & Clarke, 2021); furthermore, iterative coding and categorization enabled the identification of the recurrent patterns and relationships (Miles et al., 2014; Neale, 2016). This process of reflexive thematic analysis culminated in thematically coherent findings aligned with the established pedagogy (Saldaña, 2021).

The themes that initially emerged from the interview data were cross validated through document analysis to ensure analytical robustness. Systematic coding techniques were employed to establish a clear audit trail, thereby enhancing the transparency and repeatability of the analysis. Furthermore, the duration of this study was extended to ensure the validity of the results. To facilitate a structured and comprehensive interpretation, codes were inductively generated from both primary and secondary data sources. To strengthen the authenticity and

credibility of the data, the researcher engaged in follow-up discussions with the informants outside regular school hours, to ensure the accuracy and contextual relevance of the information collected.

Methodological triangulation was implemented by integrating multiple data sources and analytical techniques. Triangulation was conducted by integrating the interview and the data gathered in the focus group discussions: the interviews captured individual insights, focus groups reflected the group dynamics, and cross-checking the two sources enhanced the validity and depth of the findings. This strategy not only enhanced the internal validity and credibility of the findings but also mitigated the influence of potential researcher biases, thus improving the overall trustworthiness of the study (Creswell & Plano Clark, 2023).

NVivo 12 was used to generate the initial categories and themes, which were subsequently organized and refined through an iterative coding cycle (Jackson & Bazeley, 2019). The coding procedure was carried out progressively, starting with open coding, and subsequently refined through axial coding until the overarching themes were identified. To enhance the trustworthiness of the analysis, intercoder verification and member checking were employed. These strategies ensured the credibility of the findings, which faithfully represent the meanings as construed by the participants.

NVivo supports this process by enabling researchers to visualize the code relationships, construct hierarchical nodes, and identify the patterns across datasets (Allsop et al., 2022; Jackson & Bazeley, 2019). A thematic analysis was conducted through sustained engagement with the data and ensuring that the emerging themes were grounded in the participants' responses and aligned with the study's objectives (Christou, 2022; Jowsey et al., 2021). This approach provided a structured yet flexible framework for interpreting the qualitative data, thereby enhancing the depth and rigor of the analysis (McLeod, 2024).

## **4. Results**

This study investigated the challenges teachers encountered and the strategies they employed to implement a deep-learning-oriented curriculum. The findings reveal three core themes: (1) Specific challenges during implementation; (2) Teachers' competence in addressing the pedagogical and content demands; and (3) Strategies used to overcome these challenges.

### **4.1 What Challenges Do Teachers Face When They Implement the Curriculum With Innovative Pedagogy?**

Teachers faced persistent challenges, such as insufficient training, limited follow-up support, and entrenched teaching habits. Several admitted not fully understanding the concept of deep learning, which underscored the gap between policy expectations and classroom practice. A teacher explained, "I know that deep learning is important, but I don't know how to apply it in my classroom" (AMR, Interview). These findings highlight the need for structured, practice-based professional development and sustained mentoring, as illustrated in Figure 1.



**Figure 1: Schematic representation of curriculum implementation challenges**

The schematic (Figure 1) reveals that the teachers' principal challenges included limited conceptual understanding and inadequate training quality. Less experienced teachers displayed greater adaptability, whereas older teachers demonstrated stronger diligence in administrative tasks. The impact of **teachers' working groups** is context-dependent and is shaped by school conditions, facilitator support, and participant motivation, as explained by a participant:

*"I know that teachers must adapt to change, but I prefer my own style. Training was held, but the effect was temporary. I soon went back to my old way of teaching."* (NRL, Interview).

The participant's utterance reflects an aspiration to align with the innovative curriculum. However, entrenched pedagogical practices are a significant barrier to sustainable reform. Change is possible but is often short-lived and is not accompanied by ongoing support. Participant HRS concurred with the aforementioned two participants.

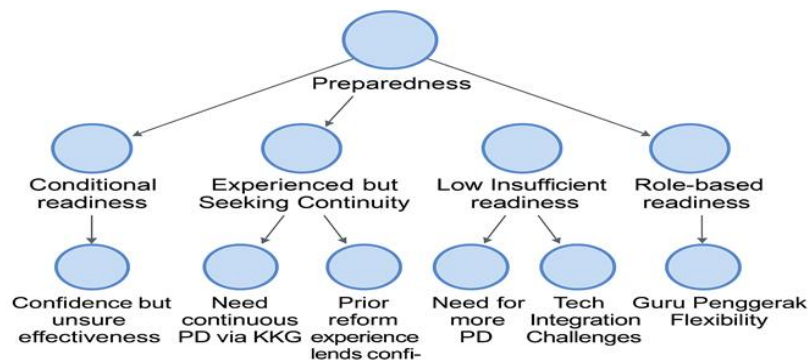
*"Deep learning is a learning method that can help the students understand the concepts perfectly. Regarding how to incorporate it into my current teaching style, I'm not entirely sure. We need training on how to implement the deep learning method."* (HRS, Interview)

The participants' statements reveal that, despite recognizing the importance of deep learning, teachers struggle to apply it consistently in practice. Limited practical knowledge, resistance to changing entrenched habits, and the absence of sustained training expose a serious gap between curriculum policy and classroom reality.

#### **4.2 How Do Teachers Perceive Their Competencies in Relation to Curriculum Innovation Demands?**

Based on the analysis of the interview transcripts, primary school teachers reported that their competencies did not adequately align with the demands of curriculum innovation. They expressed feeling burdened, insufficiently supported, and inadequately prepared to implement new approaches. Consequently, the integration of innovation in learning was at risk of being

constrained, because the optimal internalization of innovation requires both sufficient competencies and institutional support. Figure 2 illustrates the teachers' capacity to meet the curriculum innovation requirements.



**Figure 2: Schematic representation of the curriculum implementation preparedness**

Issues related to technological readiness were also identified. Several teachers encountered challenges integrating digital tools in their instructional practices. A participant expressed the following:

*"In the absence of such training, it becomes challenging for educators to effectively advance. To support the development of practical skills, it is crucial to provide concrete examples drawn from real classroom contexts."(AMR, Interview)*

AMR highlighted a notable conceptual gap and limited comprehension of the key principles, particularly in the domain of deep learning. Similarly, HRS emphasized a persistent and concerning misalignment between curricular expectations and actual classroom practices, thereby highlighting a critical challenge in bridging theory and pedagogical implementation.

*"I am still unclear on what "deep learning" truly entails. I believe that this is the initial challenge: gaining a clear understanding of the concept."(HRS, Interview)*

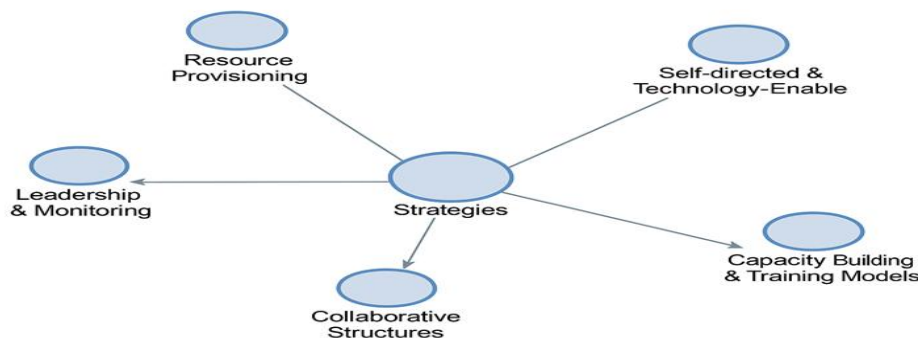
This perspective was supported by RDD, who highlighted the necessity of ongoing professional development to ensure the effective implementation of deep learning strategies.

*"The success of educational strategies depends on adapting previous knowledge and experience. Success is challenging due to the diverse student populations, which require different pedagogy, especially in the rural contexts."(RDD, Interview)*

The participants emphasized that their capacity to implement curriculum reform remained limited in several key areas. Successful reform requires a solid understanding of both concepts and practices. However, current conditions reveal inadequate systemic support, insufficient classroom-based training, and weak adaptation of the learning strategies to suit the students' needs. Without comprehensive intervention, the risks facing reform that impede education transformation may, ultimately, lead to failure to achieve reform objectives.

### 4.3 Which Strategies Do Teachers Use to Strengthen Teaching Competencies to Achieve Curriculum Innovation?

Experienced teachers tended to display greater confidence in and openness to innovation; however, sustained professional development is essential. Regular engagement in collaborative platforms strengthens their pedagogical knowledge and instructional skills. Valuing the teachers' self-assessed competence while identifying their strengths for improvement fosters adaptive, context-sensitive strategies that make teaching and learning more dynamic, reflective, and responsive to contemporary challenges (Figure 3).



**Figure 3: Schematic representation of teachers' strategies**

Figure 3 presents five strategic priorities for effective curriculum implementation: (1) capacity building through professional development; (2) collaborative governance; (3) leadership and monitoring; (4) provision of essential resources; and (5) technological integration for self-directed learning. These strategies reveal that professional development is not merely a supportive factor, but decisive in shaping the teachers' readiness to implement the reformed curriculum. Evidence from early-career teachers indicates that their emphasis on collaboration and resource accessibility reflects an acute need for systemic support in the initial stages of practice. Such differentiation across teacher profiles implies that diversity in the teaching workforce does not weaken it but, rather, enhances the contextualization of the implementation strategies, thereby reinforcing their overall effectiveness.

*"The most effective strategy would be trainings or workshops. However, they must differ from the previous ones where we left without gaining any practical insight on how to implement what we have learned in our classrooms." (HRY, Interview)*

In support of this perspective, AMY admitted to lacking competence in the foundational principles of innovative curricula, particularly those grounded in deep learning frameworks. He emphasized the need for ongoing professional development and access to pedagogical and content-related support for effective learning.

*"Currently, I do not feel competent enough to understand the basic principles of innovative curriculum, especially those based on deep learning frameworks. I still need substantial training and ongoing professional development." (AMY, Interview)*

ASN proposed a systematic approach to professional development based on the new curriculum:

*"With the new curriculum, I propose a structured approach involving expert support every Saturday. The first session could help deepen our understanding of the content, the second could focus on applying that knowledge, and the third could help address the challenges and offer instructional guidance."* (ASN, Interview)

HRY supported this view.

*"There are several possible strategies, including independent study, training facilitated by credible experts, teacher working groups, and guidance from curriculum specialists. Technology can be a great enabler. Ultimately, the most crucial factor is the willingness to learn. Educational materials for self-learning are already available on platforms, such as YouTube."* (HRY, Interview)

The participants acknowledged their lack of readiness to adopt such a pedagogy and emphasized the need for sustained professional development to bridge the gap between theory and practice to meet contemporary education demands. Regarding classroom teacher support, ASN said:

*"However, the responsibility should not rest solely with the teachers. School principals and supervisors must also assume an active role in the continuous monitoring of classroom practices."* (ASN, Interview)

Ultimately, the participants highlighted that meaningful professional development depends on not only the teachers' willingness to learn, but also on sustained support from the principal and supervisors.

## **5. Discussion**

This qualitative study aimed to (1) Examine the challenges that teachers encounter in implementing the curriculum through innovative pedagogy; (2) Assess their competencies in meeting the demands of curriculum reform; and (3) Explore strategies for enhancing teaching competencies in support of curriculum change. By focusing on the Indonesian context, this study provides critical insights for informing local government policies to address the complexities of the new national curriculum. It also identified contextually grounded practical strategies that educators can adopt to effectively respond to curriculum innovation.

### **5.1 Teachers' challenges, readiness, and capacity**

Effective, sustainable curriculum reform requires a nuanced grasp of systemic barriers. A primary impediment is the absence of coordinated, data-informed mechanisms to diagnose and address the implementation constraints, which is compounded by little institutional support for teacher capacity, particularly deep-learning pedagogies. Core challenges include a scarcity of resources, the need for pedagogical transformation, and entrenched reluctance to change (Fangestu & Marpuah, 2025; Subiyantoro et al., 2024). Without sustained, contextually responsive interventions, it is unlikely that innovative practices will be adopted. Such resistance is attributed to ineffective communication strategies and the failure to demonstrate tangible benefits (Alshwayat et al., 2023). These factors are

intensified by limited training opportunities and unclear reform objectives (König et al., 2022; Trust & Whalen, 2020).

Teachers generally express positive interest in reforms; however, uneven readiness and limited socialization constrain effective uptake (Hidayah et al., 2022). While many teachers report being willing to adopt deep learning pedagogy, both conceptual clarity and classroom enactment remain limited. Individual and professional learning community initiatives show promise, but stronger socialization, targeted mentoring, and sustained institutional support are needed to move beyond exploratory trials (Hasanah et al., 2022).

Persistent barriers include insufficient mentoring, limited context-specific professional development, inadequate resources, and administrative overload, all of which hinder pedagogical reform (Husin et al., 2025; Tobin et al., 2024). Moreover, outdated teacher education and weak in-service training remain systemic obstacles and even established professional development models could fail in the absence of institutional and contextual alignment (Amemasor et al., 2025; Rehman et al., 2025; Tangney et al., 2023).

Teachers' capacity to implement curriculum reform through deep learning pedagogy remains limited. The current implementation cannot yet be relied upon to foster the students' critical thinking, independence, and character development. Although some progress has been made, through individual and community initiatives, many educators continue to struggle to differentiate between traditional teaching practices and approaches grounded in deep learning. Teachers unfamiliar with the new curricular content encounter considerable professional challenges, which often prompts a reversion to the established routines (Lynch et al., 2024). Increasing teacher capacity often fails to equip educators with the deep knowledge and adaptive skills they need to translate the theory of learning and development into everyday pedagogical practices.

Ironically, policy ambiguity and the absence of systematic support serve to entrench the traditional methods that ought to be challenged. Without coherent systemic backing, the sustainability of reform is compromised, and many innovations risk being reduced to little more than rhetorical policy discourse (McLure et al., 2023). A systematic review, furthermore, underscores that low teacher self-efficacy during the curriculum change process highlights the urgent need for consistent professional support (Gordon et al., 2022). Empirical evidence shows that the reluctance to adapt to change stems from limited contextual mentoring (Revina, 2023) and misalignments between the teachers' perceptions and the policy design, which is the result of inadequate instructional capacity (Kumayas et al., 2025).

## **5.2 Teachers' Strategies and Professional Development Needs**

Primary school teachers' reliance on self-directed learning and peer support is insufficient for achieving effective deep learning pedagogy. They require skilled mentors with both conceptual and practical expertise, as well as adaptability to

use AI tools. When they are judiciously integrated, AI tools such as ChatGPT can promote inclusive and dynamic learning (Ampo et al., 2025), and foster reflection and collaboration that strengthen teachers' capacity for deep learning pedagogy (Köpeczi-Bócz, 2025). Even with limited infrastructure and resources, such strategies could catalyze shifts in teachers' perspectives—an aspect that is often overlooked in international literature, which is dominated by formal training models.

Participants emphasized the importance of receiving training in the subject content, followed by classroom-based instruction that supports the implementation of this content using a deep learning approach. For long-term impact, context-responsive professional development is essential to consolidate conceptual depth and institutionalize innovative practices (Chang et al., 2024). Teachers who actively engage in professional development demonstrate a proactive orientation toward growth and advancement in their fields (Alshammari et al., 2025; Mabanag et al., 2024; Zhou et al., 2025). In rapidly changing educational environments, sustained effectiveness is supported by continuous learning, adaptability, reflective practices, and leadership (Mustafa & Lleshi, 2024; Stevens et al., 2024).

The implementation of deep learning pedagogy constitutes a mandate for every primary school teacher in Indonesia. However, the limited dissemination of the policy has created a gap between regulation and classroom practice, thereby undermining the legitimacy of the policy. This condition demonstrates that normative instruction alone is insufficient; a strategy for teachers' professional development that is oriented toward substantive capacity building rather than mere administrative compliance is essential. As emphasized by Morina et al. (2025), professional development initiatives ought to be sustained, content-focused, collaborative, and responsive to the teachers' cognitive and affective needs, to ensure that policy does not remain a regulatory directive but is genuinely internalized in pedagogical practice.

### **5.3 Teacher Working Groups and Experiential Learning**

Teacher working groups provide a collaboration forum for teachers to share practices, address challenges, and devise contextually relevant solutions. However, their effectiveness hinges on consistent implementation, the caliber of facilitation, and participant commitment, which highlights the need for more effective and efficient organization. Similarly, teacher working groups are recognized as valuable models of collaborative professional development for fostering shared learning and reflective pedagogy. Nevertheless, their potential is often limited by insufficient subject expertise and weak instructional leadership.

To maximize their impact, teacher working groups should be guided by curriculum specialists and supported by principals acting as instructional leaders, rather than as mere evaluators. Embedding expert facilitation and proactive leadership in this dual structure may enable teacher working groups to develop into dynamic professional learning communities (Chen, 2022; Grimm, 2024; Kaur et al., 2023).

Using conventional passive methodologies for professional development, such as lectures and written assignments, often fail to translate theoretical understanding into effective classroom practice. By contrast, interactive workshops grounded in experiential learning have been found to substantially enhance instructional quality (Ajani, 2023; Stavermann, 2025). Accordingly, practical teacher training should integrate experiential learning with real students. Moreover, participatory pedagogy, which values teacher input and prioritizes practical outcomes, has been found to reduce resistance while fostering a sense of ownership and commitment (El-Hamamsy et al., 2024; Talafian et al., 2025).

Teachers' voluntary engagement in teacher working groups should not be applauded merely as individual commitment, but should be recognized as an entry point for systemic professional development reform. While teacher working groups remain the only enduring model of professional growth for primary school teachers, its current form risks stagnation if not reinforced through structured, practice-oriented, and expert-led initiatives. Without such sustained professional development, the fidelity of implementation will inevitably erode, thereby undermining both teacher professionalism and student learning outcomes (Durden-Myers et al., 2024; Fixsen, 2025).

Effective curriculum reform requires a holistic strategy to eliminate the systemic barriers, strengthen teacher readiness, and cultivate intrinsic motivation. When they are supported by expert facilitators and strong instructional leadership, teacher working groups can evolve into transformative sites for professional learning. Teacher resistance stems from both limited conceptual understanding and digital fatigue. This fatigue diminishes teachers' willingness to adopt and experiment with new approaches. Moreover, when professional development fails to address these challenges, the combined effects produce a persistent cycle of resistance that is difficult to overcome.

## **6. Conclusion**

In this study, primary school teachers viewed the implementation of deep learning pedagogy with both optimism and concern and emphasized that reforms should be thoroughly developed before classroom adoption. Their perceptions were framed by the interconnected themes of challenges, capacity, and strategies. Reported difficulties included limited conceptual clarity, inadequate training and professional development, variability in mindsets and motivation, and persistent constraints regarding resources and institutional support. These issues, together with differing levels of readiness, which ranged from conditional preparedness to role-based proficiency and sustained engagement among experienced practitioners, underscore the complexity of fostering meaningful adoption of deep learning pedagogies.

Curriculum reform hinges on government policies that prioritize teacher professional development and institutional support. Deep learning can only be realized when sustained professional development is treated as a strategic priority backed by regulation, funding, and cross-school collaboration. Teachers'

willingness to collaborate to enhance their professional capacity represents a vital strength in adopting innovative approaches to curriculum implementation.

However, realizing this potential depends on the presence of deliberate institutional policies and well-structured support mechanisms. Sustainable curriculum reform in Indonesia requires the systematic integration of deep learning pedagogy, which can only be achieved through sustained, context-sensitive professional development and strong leadership engagement. Therefore, it is recommended that the District Education Office prioritizes the dissemination of curriculum reforms in primary schools through teacher professional development strategies that are contextually grounded and responsive to the specific needs of each school.

## 7. Acknowledgements

The authors would like to express their sincere gratitude to the Rector, the Head of the Institute for Research and Community Service, and the Dean of the Faculty of Education, Makassar State University, for their invaluable support and encouragement throughout the conduct of this research and the preparation of this manuscript.

The authors also acknowledge the use of AI (ChatGPT Plus) as an assistive tool for improving sentence formulation and clarity. All ideas, analyses, and interpretations presented in this article remain solely those of the authors. Guidance provided by Editage to align the manuscript's grammar and formatting with the required journal style is acknowledged.

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