

Teacher Leaders' Strategies in Implementing Deep Learning within the Merdeka Curriculum: A Multi-Case Study in Islamic Primary Schools

Eva Nur Khofifah^{*1}, St Mislikhah², Lailatul Usriyah³

^{1,2,3}UIN Kiai Haji Achmad Siddiq Jember, Indonesia

*Correspondence Author: evanurkhofifa@gmail.com

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Abstract: The Merdeka Curriculum promotes deep learning to cultivate meaningful understanding, critical thinking, and 21st-century competencies among students. However, its implementation in Islamic primary schools (*madrasahs*) remains challenging due to limited resources, teacher readiness, and contextual constraints. This study explores the strategies employed by Teacher Leaders (*Guru Penggerak*) in implementing deep learning within two *madrasahs*: MI Raudhatul Jannah Jenggawah and MI Al Barokah Annur Jember. Using a qualitative phenomenological approach, six teacher leaders (three from each school) participated in in-depth interviews, classroom observations, and documentation analysis. The findings indicate that teacher leaders initially encountered misconceptions and anxiety regarding deep learning, often equating it with technology integration. Over time, they adopted adaptive strategies such as project-based learning, reflective questioning, simple learning media, and integrating cultural and family experiences into classroom activities. Despite challenges such as limited digital facilities, time constraints, and occasional parental resistance, these strategies fostered greater student engagement and active participation. The study underscores the pivotal role of teacher leaders as change agents who bridge the gap between curriculum ideals and classroom realities. Contextual, resource-sensitive strategies and sustained professional development are essential to ensure the effective and sustainable implementation of deep learning in madrasah settings.

Keywords: Teacher Leaders, Deep Learning, Merdeka Curriculum, Islamic Primary School, Learning Strategies

Abstrak: Kurikulum Merdeka mendorong pembelajaran yang mendalam untuk menumbuhkan pemahaman yang bermakna, pemikiran kritis, dan kompetensi abad ke-21 di antara para siswa. Namun, implementasinya di sekolah dasar Islam (*madrasah*) masih menjadi tantangan karena keterbatasan sumber daya, kesiapan guru, dan kendala kontekstual. Studi ini mengeksplorasi strategi yang digunakan oleh Guru Penggerak dalam mengimplementasikan pembelajaran yang mendalam di dua madrasah: MI Raudhatul Jannah Jenggawah dan MI Al Barokah Annur Jember. Dengan menggunakan pendekatan fenomenologi kualitatif, enam guru penggerak (tiga dari setiap sekolah) berpartisipasi dalam wawancara mendalam, observasi kelas, dan analisis dokumentasi. Temuan menunjukkan bahwa para pemimpin guru pada

awalnya mengalami kesalahpahaman dan kecemasan terkait pembelajaran yang mendalam, dan sering menyamakannya dengan integrasi teknologi. Seiring berjalannya waktu, mereka mengadopsi strategi adaptif seperti pembelajaran berbasis proyek, pertanyaan reflektif, media pembelajaran sederhana, dan mengintegrasikan pengalaman budaya dan keluarga ke dalam kegiatan di kelas. Terlepas dari tantangan seperti fasilitas digital yang terbatas, keterbatasan waktu, dan terkadang penolakan dari orang tua, strategi-strategi ini mendorong keterlibatan siswa yang lebih besar dan partisipasi aktif. Studi ini menggarisbawahi peran penting para pemimpin guru sebagai agen perubahan yang menjembatani kesenjangan antara cita-cita kurikulum dan kenyataan di kelas. Strategi yang kontekstual, peka terhadap sumber daya, dan pengembangan profesional yang berkelanjutan sangat penting untuk memastikan implementasi pembelajaran yang mendalam yang efektif dan berkelanjutan di lingkungan madrasah.

Kata Kunci: Guru Penggerak, Deep Learning, Kurikulum Merdeka, Madrasah Ibtidaiyah, strategi pembelajaran

Introduction

Education in the 21st century requires a paradigm shift from traditional methods of content delivery to approaches that emphasize meaningful learning, critical thinking, creativity, and character formation (Gustiningsi et al., 2024). This transformation has been institutionalized in Indonesia through the Merdeka Curriculum, a reform designed to promote student autonomy, differentiated instruction, and the cultivation of competencies relevant to global challenges (Rokayah et al., 2023). Its central goal is not merely knowledge transmission but the nurturing of higher-order thinking skills and character values aligned with the Pelajar Pancasila profile. One of the key approaches underpinning this reform is deep learning. Brilliananda et al., (2025), which encourages learners to analyze, evaluate, and synthesize knowledge beyond rote memorization, connecting concepts to real-life contexts for long-term understanding.

However, a persistent gap remains between the ideals of the Merdeka Curriculum and classroom realities. Although the curriculum emphasizes deep learning as a core pedagogical principle, many teachers still apply surface-level instructional practices. Lessons often focus on completing textbook material and meeting assessment requirements rather than promoting critical dialogue, collaboration, and reflective learning. Teachers, particularly in madrasah ibtidaiyah, face multiple structural and cultural challenges, including limited digital facilities, insufficient training, and traditional teacher-centered habits (Rosanawati et al., 2025). This issue is particularly urgent for madrasahs, as pedagogical traditions and systemic inequities often hinder these institutions from realizing deep learning and promoting innovation.

Studies on deep learning itself also reveal mixed outcomes. International literature describes deep learning as a transformative pedagogical approach capable of promoting 21st-century skills and lifelong learning. For example, research in Finland and Canada has shown that when deep learning is integrated systematically into curriculum and assessment, students demonstrate improved critical thinking, creativity, and engagement with real-world issues (Umar et al., 2025). In Indonesia, particularly during the COVID-19 pandemic, a number of studies have examined how digital learning aids facilitate deep learning (Ramadhan et al., 2023). However, these studies focus on technology use rather than teachers' broader pedagogical strategies to embed deep learning principles into their instruction.

Within this context, *Guru Penggerak* or teacher leaders actively play a central role in realizing the ideals of the curriculum. The Ministry of Education, Culture, Research, and Technology of Indonesia established the *Guru Penggerak* program to develop innovative, reflective, and collaborative educators capable of transforming school practices (Fatimah et al., 2024). These teacher leaders actively serve as role models who bridge curriculum theory and teaching practice by demonstrating exemplary pedagogy, mentoring their peers, and leading learning innovations. Ideally, they translate deep learning principles into concrete classroom strategies, designing project-based lessons, integrating digital literacy, and fostering reflective and student-centered learning environments.

However, implementing deep learning in madrasah contexts presents unique challenges. Many madrasahs, especially those in rural areas, face resource limitations, large class sizes, and minimal technological infrastructure (Wijaya, 2025). Teachers also struggle to interpret deep learning accurately, sometimes equating it with technology use or viewing it as intensive content delivery. This misunderstanding highlights the broader issue of bridging theoretical frameworks with practical comprehension among practitioners.

Previous research has examined curriculum reform, teacher leadership, and deep learning implementation in Indonesia (Irfanuddin et al., 2025). While these studies acknowledge the significance of teacher leaders as change agents, most focus on policy evaluation or program analysis rather than the lived classroom experiences of teacher leaders. Moreover, few studies have explored how these teachers develop and implement concrete strategies to actualize deep learning, particularly within madrasahs' socio-cultural and resource constraints (Muvid, 2024). While the research conducted by Hidayat & Haryati, (2025); Xie et al., (2020); Yang et al., (2021), focuses on the application of deep learning effectively in various subjects such as math, science, and language. Existing literature emphasizes macro-level reform and often treats teachers as a homogeneous group, overlooking the diverse urban, rural, and remote school contexts that shape their pedagogical approaches.

By offering a phenomenological investigation of teacher leaders' approaches to deep learning implementation under the Merdeka Curriculum in madrasah settings, this study aims to close that gap (Fauskanger & Bjuland, 2018; Isnaeni et al., (2025). By capturing teacher leaders' voices and lived experiences from diverse geographical and institutional contexts, this research provides a nuanced understanding of how these educators interpret, practice, and adapt deep learning in authentic classroom settings. It contributes to the body of knowledge in three key ways: (1) documenting the concrete strategies employed by teacher leaders, (2) highlighting contextual challenges such as infrastructural limitations and cultural expectations, and (3) identifying adaptive innovations that can inform broader educational policy and practice.

The background of this study underscores the urgency of exploring teacher leadership strategies in the context of the Merdeka Curriculum and deep learning. The gap between policy and practice reflects broader challenges of educational reform in Indonesia. Previous studies highlight important aspects of teacher roles and curriculum change, but leave unanswered questions regarding the specific strategies of teacher leaders.

The research gap thus provides the rationale for this investigation. At the same time, the novelty lies in its phenomenological focus on teacher leadership practices within

madrasahs, a dimension rarely examined in existing research. This focus offers a new lens for understanding curriculum reform in Islamic education settings. Ultimately, this study contributes theoretically and practically by documenting contextualized strategies and adaptive innovations that bridge the gap between curriculum ideals and classroom realities. It emphasizes the urgency of empowering teacher leaders in madrasahs as agents of pedagogical transformation toward meaningful and sustainable deep learning implementation.

Method

This study employed a qualitative multi-case study with a phenomenological orientation to explore how teacher leaders (*Guru Penggerak*) implement deep learning strategies as part of the Merdeka Curriculum in two Islamic primary schools (Madrasah Ibtidaiyah) in Jember Regency, East Java. The researcher chose a multi-case design to gain comparative insights across different school contexts. The phenomenological orientation enabled a deep exploration of teachers' lived experiences and meaning-making processes (Sugiyono, 2019).

The research sites were MI Raudhatul Jannah Jenggawah and MI Al Barokah Annur Jember, which were selected purposively to represent diverse institutional characteristics. MI Raudhatul Jannah is a relatively well-resourced madrasah with an active community partnership program. In contrast, MI Al Barokah operates in a semi-rural area with limited facilities and fewer teacher leaders. This contrast allowed for richer comparative data regarding how context influences the implementation of deep learning.

The study involved six teacher leaders, three from each school, who met specific inclusion criteria: (1) officially certified as *Guru Penggerak* by the Ministry of Education, (2) actively teaching in upper primary grades (IV–VI), and (3) directly engaged in designing and implementing profound learning-oriented lessons. Although the sample size is relatively small, the researcher considered it appropriate because the study prioritizes depth over breadth, allowing a detailed exploration of each teacher's experiences and strategies. To maintain confidentiality, the researcher assigned pseudonyms (GP1–GP6) to all participants.

The researcher collected data through semi-structured interviews, classroom observations, and document analysis. Participants were interviewed once or twice (60–90 minutes per session) to capture their perceptions, challenges, and strategies. Classroom observations were conducted twice for each teacher during regular lessons to document authentic teaching practices and student engagement. Supporting documents, including lesson plans, teaching portfolios, and student work, were analyzed to triangulate findings.

Data analysis followed Cresswell, (2016) steps for phenomenological analysis: (1) transcribing interviews verbatim, (2) reading transcripts and field notes repeatedly to gain a holistic view, (3) coding significant statements, (4) grouping them into categories and themes, and (5) developing textual and structural descriptions that reflect both what and how participants experienced the phenomenon. These descriptions were then synthesized into overarching themes that captured the essence of teacher leadership in implementing deep learning across cases.

The study applied credibility, transferability, dependability, and confirmability criteria to ensure trustworthiness. Credibility was established through prolonged engagement, member checking, and triangulation of data sources. Transferability was strengthened by providing thick contextual descriptions. Dependability was

ensured by maintaining a clear data collection and analysis audit trail. Confirmability was achieved through reflective journaling to minimize researcher bias. Ethical clearance was obtained from both school principals, and all participants provided informed consent.

Through these procedures, this study provides a rigorous and ethically grounded examination of how teacher leaders in two contrasting madrasah contexts strategize, adapt, and lead the implementation of deep learning within the Merdeka Curriculum framework.

Result and Discussion

Result

Findings at MI Raudhatul Jannah Jenggawah

1. Initial Misconceptions

At the beginning of the Merdeka Curriculum implementation, the three Teacher Leaders (GP1, GP2, and GP3) at MI Raudhatul Jannah Jenggawah experienced conceptual confusion regarding the meaning of *deep learning*. They initially assumed it was a technology-driven or project-heavy instructional model that would be difficult for teachers and students to manage.

GP1 admitted feeling anxious because she equated deep learning with complicated digital tasks. GP2 thought deep learning was identical to using laptops or online platforms. At the same time, GP3 believed that students were not yet ready for self-directed learning and would rely entirely on teacher instructions. This misconception reflected a surface-level understanding of deep learning as procedural rather than transformative.

Table 1. Initial Misconceptions MI Raudhatul Jannah Jenggawah

Participant	Key Statement	Interpretation
GP1 (F)	"I felt anxious because deep learning seemed too complicated. I was afraid students could not understand it."	Teachers initially perceived deep learning as a difficult, high-tech approach.
GP2 (M)	"At first, I thought deep learning meant using laptops and the internet."	Misconception that deep learning equals technology use rather than critical pedagogy.
GP3 (F)	"Students wait for the teacher to give answers; I was unsure how to make them independent."	Misunderstanding deep learning as complete student autonomy without guided support.

2. Adaptive Strategies

After gaining more experience and support from the teacher leaders training program, the teachers gradually developed adaptive, context-based strategies to overcome their initial anxieties. The teachers realized they could facilitate deep learning through meaningful yet straightforward learning tasks, minimizing dependence on technology. These practices marked a shift from fear of complexity toward confidence in facilitating active learning through local and low-cost approaches.

Table 2. Adaptive Strategies MI Raudhatul Jannah Jenggawah

Participant	Strategy Applied	Example of Implementation	Analytical Insight
GP1 (F)	Contextual multimedia use	Played a short video on traditional markets, followed by group discussion.	Visual media made abstract concepts concrete and increased curiosity.

GP2 (M)	Project-based learning	Asked students to design posters on waste management.	Real-life projects built problem-solving and collaboration.
GP3 (F)	Reflective questioning	Used prompts such as "Why is this lesson important for you?"	Encouraged metacognition and personal connection to content.

3. Student Engagement

A notable transformation occurred in students' behavior once teachers applied these adaptive strategies. All three teacher leaders reported that students who were initially quiet and hesitant became active participants in discussions and presentations. Activities tied to students' everyday lives encouraged curiosity, motivation, and ownership of learning.

For example, GP1 shared a meaningful moment when a previously shy student confidently presented her group's poster on energy saving. GP2 observed that group discussions on local environmental issues helped students express opinions openly. GP3 emphasized how reflective dialogues made students relate the lessons to family practices, such as separating waste at home.

Table 3. Student Engagement MI Raudhatul Jannah Jenggawah

Participant	Indicator of Engagement	Supporting Evidence	Interpretation
GP1 (F)	Increased confidence	"A quiet student volunteered to present her project on saving energy."	Deep learning fosters confidence and self-expression.
GP2 (M)	Active collaboration	"Students discussed waste problems actively and presented their posters."	Team-based inquiry encourages participation and peer interaction.
GP3 (F)	Reflective participation	"Students shared family stories about how they manage household waste."	Linking lessons to daily life enhances meaning and retention.

4. Parental Involvement

Parental involvement in MI Raudhatul Jannah was relatively limited but gradually improved through teachers' communication efforts. Some parents initially expressed concern that the *deep learning* projects were too demanding, especially when they involved home-based activities. Teachers addressed this issue by explaining the educational purpose of such tasks and emphasizing the development of students' critical and creative thinking skills.

In several instances, parents became supportive after seeing their children's enthusiasm and tangible outcomes, such as posters or home reflection sheets. The teachers recognized that sustained parental collaboration is essential for the long-term success of deep learning implementation.

Table 4. Parental Involvement MI Raudhatul Jannah Jenggawah

Participant	Parent Response	Teacher's Strategy	Interpretation
GP1 (F)	Parents were curious but cautious about projects.	Explained learning objectives through class WhatsApp group.	Transparent communication reduced parental anxiety.
GP2 (M)	Some parents questioned the relevance of projects.	Shared students' work during open class sessions.	Parental understanding grew after seeing authentic student outputs.

GP3 (F)	Limited parental support in rural households.	Sent reflection notes for parents to read at home.	Home-school linkage needs stronger structure.
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5. Resource Constraints

MI Raudhatul Jannah faced severe resource constraints—limited access to digital tools, few projectors, and an inadequate internet connection. These challenges initially discouraged teachers from implementing *deep learning*, but they later viewed limitations as opportunities for creative teaching.

The teachers mixed analog and digital media: GP1 used PowerPoint slides and short offline videos, GP2 prepared printed worksheets and recycled materials for posters, and GP3 combined story discussions with minimal technological use. Their creativity exemplified "low-resource deep learning," proving that meaningful learning is achievable even in constrained contexts.

Table 5. Resource Constraints MI Raudhatul Jannah Jenggawah

Participant	Identified Constraint	Adaptive Action	Interpretation
GP1 (F)	Lack of computers and internet access.	Used simple videos offline via projector.	Deep learning can occur without advanced technology.
GP2 (M)	Few visual materials available.	Provided printed handouts and local waste samples for analysis.	Hands-on learning compensates for digital scarcity.
GP3 (F)	Short instructional time and no digital devices.	Combined printed worksheets with storytelling.	Integrative approach ensures learning continuity.

6. Teacher Leadership Role

As Teacher Leaders, the teachers of MI Raudhatul Jannah also acted as local innovators and mentors. They applied deep learning strategies in their classrooms and shared best practices with colleagues during regular teacher meetings. This peer collaboration strengthened their professional identity and fostered a culture of reflective practice.

GP3, for instance, frequently shared its reflective questioning techniques with other teachers, while GP1 discussed how to simplify project-based learning using local resources. Such activities demonstrate the function of teacher leadership as a driving force for pedagogical transformation in low-resource Islamic primary schools.

Table 6. Teacher Leadership Role MI Raudhatul Jannah Jenggawah

Participant	Leadership Practice	Example of Evidence	Interpretation
GP1 (F)	Peer sharing	Presented simple digital teaching models at teacher meetings.	Encourages diffusion of deep learning methods across the school.
GP2 (M)	Modeling practice	Demonstrated project-based learning during peer observation.	Leadership through example supports professional learning.
GP3 (F)	Reflective mentoring	Shared reflective questioning approach with junior teachers.	Builds professional dialogue and collective growth.

Findings at MI Al Barokah Annur Jember

1. Initial Misconceptions

The three Teacher Leaders (GP4, GP5, and GP6) at MI Al Barokah Annur Jember initially misunderstood the concept of deep learning in ways similar to their peers at MI Raudhatul Jannah. However, their misconceptions were more pedagogical than technological. They assumed deep learning meant providing more difficult or "advanced" materials rather than engaging students in deeper cognitive and reflective processes.

GP4 described deep learning as "too heavy for young learners," while GP5 initially thought it required a constant focus on abstract knowledge. GP6 felt confused when asked to integrate reflection and inquiry because she believed primary school students would struggle to think conceptually. These views reflect a traditional belief that "good learning" equals covering more content, rather than fostering critical understanding.

Table 7. Initial Misconceptions MI Al Barokah Annur Jember

Participant	Key Statement	Interpretation
GP4 (M)	"I thought deep learning was too heavy for children."	Teachers equated deep learning with cognitively advanced or abstract content.
GP5 (F)	"At first, I believed deep learning meant giving more difficult lessons."	Misunderstood deep learning as complexity of material, not depth of thinking.
GP6 (F)	"Students were confused when I asked reflective questions."	Lack of clarity about how to scaffold reflection for primary students.

2. Adaptive Strategies

After attending workshops and mentoring sessions from teacher leaders facilitators, MI Al Barokah teachers began adopting more feasible, student-centered strategies to actualize deep learning. Instead of "hard" material, they emphasized meaningful learning that connects classroom content with students' social environment. Teachers redefined deep learning through these strategies as personal, experiential, and reflective learning rather than merely difficult.

Table 8. Adaptive Strategies MI Al Barokah Annur Jember

Participant	Strategy Applied	Example of Implementation	Analytical Insight
GP4 (M)	Context-based project	Students observed school sanitation and created health posters.	Learning becomes meaningful when grounded in students' environment.
GP5 (F)	Story-based learning	Used picture stories on environmental care and moral lessons.	Narratives simplify abstract concepts for young learners.
GP6 (F)	Cultural reflection	Asked students to share traditions practiced in their families.	Integrating local wisdom strengthens identity and reflection.

3. Student Engagement

The introduction of contextual and reflective strategies significantly improved student engagement. Teachers observed that students became more curious, expressive, and involved in class discussions and projects. Using culturally familiar topics and visual materials, teachers enabled students to build emotional and cognitive connections with the learning content.

GP4 observed that students took ownership of their learning by conducting small surveys about hygiene. GP5 found that story-based lessons made reluctant learners enthusiastic, while GP6 noticed that reflective discussions about family traditions-built students' self-confidence and pride in local culture.

Table 9. Student Engagement MI Al Barokah Annur Jember

Participant	Indicator of Engagement	Supporting Evidence	Interpretation
GP4 (M)	Initiative and curiosity	"Students were excited to observe and report hygiene practices."	Authentic learning encourages initiative and responsibility.
GP5 (F)	Emotional connection	"Students laughed and shared their own experiences from the story."	Emotional resonance enhances motivation and comprehension.
GP6 (F)	Cultural pride	"They were proud to explain their family's traditional ceremonies."	Deep learning supports cultural identity and self-expression.

4. Parental Involvement

Parental involvement at MI Al Barokah was dynamic and significant. Initially, several parents expressed skepticism, thinking that deep learning projects were burdensome or irrelevant. GP4 received direct feedback from parents who worried about the time needed for home interviews and reflections. However, after continuous communication and home-based exhibitions of student projects, most parents began to support the new learning model.

Teachers reported that parents started helping their children with projects, such as creating posters or collecting local data. This collaboration enhanced students' learning experience and bridged the gap between school and home values, fostering a shared sense of educational purpose.

Table 10. Parental Involvement MI Al Barokah Annur Jember

Participant	Parent Response	Teacher's Approach	Interpretation
GP4 (M)	Initial complaints about extra workload.	Conducted informal meetings to explain learning goals.	Parental engagement improves through transparency and dialogue.
GP5 (F)	Positive curiosity and cooperation.	Invited parents to view student exhibitions.	Visibility of learning outcomes builds trust and pride.
GP6 (F)	Parents assisted in cultural projects.	Encouraged family storytelling as part of assignments.	Home participation reinforces intergenerational learning.

5. Resource Constraints

Like MI Raudhatul Jannah, MI Al Barokah faced infrastructural limitations such as unstable internet connections, minimal computer access, and limited teaching materials. However, teachers demonstrated creativity and adaptability in navigating these challenges.

GP4 reused old posters and recyclable materials for health projects. GP5 designed her visual cards, while GP6 utilized oral storytelling as a no-cost but highly engaging pedagogical tool. These approaches highlight how deep learning depends not on technological sophistication but on teachers' ability to contextualize knowledge and stimulate inquiry with available resources.

Table 11. Resource Constraints MI Al Barokah Annur Jember

Participant	Constraint Identified	Adaptive Action	Interpretation
GP4 (M)	Lack of digital facilities.	Used recycled materials for posters and models.	Resource creativity enhances sustainability and engagement.
GP5 (F)	No projector or digital visuals.	Created illustrated story cards by hand.	Pedagogical ingenuity compensates for technological gaps.
GP6 (F)	Limited teaching media.	Used oral narratives and cultural discussions.	Cultural capital serves as a pedagogical resource.

6. Teacher Leadership Role

The three teacher leaders from MI Al Barokah Annur Jember displayed leadership through collaboration, peer support, and reflective practice. They functioned as mediators who connected the philosophical principles of the Merdeka Curriculum with real classroom conditions.

GP4 regularly mentored younger teachers, demonstrating how to design feasible projects aligned with deep learning principles. GP5 initiated small sharing sessions where teachers discussed classroom challenges, while GP6 was a reflective practitioner who encouraged joint problem-solving. Collectively, they exemplified distributed leadership, turning the school into a collaborative professional learning community.

Table 12. Teacher Leadership Role MI Al Barokah Annur Jember

Participant	Leadership Action	Illustrative Evidence	Interpretation
GP4 (M)	Mentorship and demonstration	"I helped junior teachers design their first deep learning project."	Mentoring strengthens the diffusion of innovation within the school.
GP5 (F)	Peer facilitation	"We have regular discussions about what works in class."	Collective reflection promotes sustainable improvement.
GP6 (F)	Collaborative reflection	"We often share our students' feedback to refine activities."	Shared learning fosters community and professional growth.

Cross-Case Analysis: MI Raudhatul Jannah Jenggawah and MI Al Barokah Annur Jember

The cross-site comparison between MI Raudhatul Jannah Jenggawah and MI Al Barokah Annur Jember reveals both shared trajectories and distinct contextual adaptations in the implementation of *deep learning* under the Merdeka Curriculum. Both schools are Islamic elementary institutions located in rural Jember Regency, led by Teacher Leaders who participated in the *Guru Penggerak* program. Despite similar challenges limited facilities, evolving parental engagement, and initial conceptual confusion their pathways to transformation diverged based on school culture, leadership patterns, and community involvement.

Table 13. Cross-Site Comparison of Themes

Theme	MI Raudhatul Jannah Jenggawah	MI Al Barokah Annur Jember	Cross-Site Insights
Initial Misconceptions	Teachers misunderstood deep learning as a technology-heavy model requiring advanced tools.	Teachers believed deep learning meant difficult content or abstract material.	Both schools faced conceptual confusion; one technological, the other pedagogical, revealing the need for clearer professional orientation.
Adaptive Strategies	Used short videos, poster projects, and reflective questioning to contextualize lessons.	Applied storytelling, cultural projects, and sanitation campaigns for experiential learning.	Different forms, same purpose—contextualized, meaningful, and low-resource pedagogical innovation.
Student Engagement	Students became more active, collaborative, and reflective through projects.	Students became emotionally connected and proud of cultural identities.	Engagement evolved along cognitive (Jenggawah) and affective (Annur) dimensions—both reflecting learner ownership.
Parental Involvement	Parents were hesitant; participation increased after teacher communication.	Parents became progressively involved through exhibitions and storytelling projects.	The level of parental engagement depended on school-community communication and transparency.
Resource Limitations	Combined analog-digital media using minimal technology.	Relied on storytelling, recycled materials, and handmade visuals.	Both overcame material scarcity through creativity; context-based innovation substituted for technology.
Time Constraints	Extended activities across multiple class sessions.	Simplified project scope to fit limited hours.	Time management emerged as a structural barrier to sustaining deep learning across both sites.
Teacher Leadership Role	Focused on modeling and mentoring peers during teacher meetings.	Focused on collaboration and reflective sharing within teacher communities.	Both embodied distributed leadership; Raudhatul Jannah led through modeling, while Al Barokah emphasized peer reflection.

Discussion

This discussion section interprets the study's findings in relation to relevant theoretical and empirical literature. It explores each subtheme to highlight how teachers developed their understanding, adapted classroom practices, and exercised leadership in implementing the deep learning approach within the Merdeka Curriculum. The analysis integrates evidence from both sites, MI Raudhatul Jannah Jenggawah and MI Al Barokah Annur Jember, to identify similarities, contextual variations, and broader pedagogical implications.

1. Initial Misconceptions

At the early stage of implementing the Merdeka Curriculum, teachers from both Islamic primary schools experienced significant conceptual confusion regarding the meaning of deep learning. In MI Raudhatul Jannah, teachers assumed deep learning relied heavily on technology and sophisticated digital tools. In contrast, in MI Al Barokah, teachers perceived it as a cognitively demanding or abstract form of instruction that exceeded their students' capabilities. These misconceptions mirror what (Reeder & Rushton, 2024). Identify as conceptual inertia, a condition in which teachers interpret new pedagogies through the lens of traditional paradigms. Similarly, Senduk (2024) and Isnaeni et al., (2025) emphasize that early misunderstandings are typical in educational reforms because teachers often equate innovation with increased complexity or technological dependence rather than a transformation in thinking and learning.

In both schools, such misconceptions triggered anxiety and resistance among teachers, who initially felt unprepared to design student-centered lessons. However, through mentoring, collegial dialogue, and hands-on reflection, these teachers gradually reframed their understanding of deep learning as a process emphasizing relevance, inquiry, and reflection rather than digital sophistication. This shift aligns with the assertion by Dang et al. (2022), that sustained professional learning grounded in practice is essential for overcoming conceptual barriers. The transformation of understanding observed in both contexts thus illustrates the process of cognitive reframing, in which teachers' prior beliefs evolve through experiential and collaborative learning.

This finding implies that teacher education programs should transmit theoretical knowledge and provide conceptual scaffolding that guides educators to reinterpret their beliefs through modeling and reflective dialogue. By clarifying misconceptions early in training, teacher educators can prevent confusion and help teachers understand deep learning as a pedagogical orientation rather than a technical process.

2. Adaptive Strategies

Following conceptual clarification, both groups of teachers began to develop adaptive strategies to implement deep learning in ways consistent with their school contexts and available resources. Teachers at MI Raudhatul Jannah employed short videos, poster-based projects, and reflective questioning to encourage inquiry. In contrast, teachers at MI Al Barokah favored storytelling, cultural projects, and health-related activities that connected directly to students' lived experiences. These strategies exemplify what Baharuddin & Burhan (2025) describe as situated adaptation, where teachers localize global innovations to fit their classrooms' social and material realities.

This adaptive creativity also reflects findings from Grimm, (2024), who reports that Professional Learning Communities (PLCs) are powerful contexts for teacher-led innovation because they enable collaborative experimentation and reflection.

Teachers' adaptive agency emerges when they have autonomy to design and modify learning processes to meet contextual needs, rather than following prescriptive models (Grimm, 2024). In both madrasahs, teachers learned to balance curriculum goals with contextual constraints, demonstrating that deep learning is not a uniform model but a flexible framework responsive to local values and conditions.

The implication of this finding is twofold. First, effective professional development should encourage teachers to adapt, not adopt, to internalize pedagogical principles and apply them creatively. Second, school leaders must cultivate safe spaces for experimentation where teachers can test ideas, reflect collectively, and refine practices. [Mariyah & Firdaus, \(2024\)](#) Argue that adaptive professionalism is the core driver of sustained pedagogical transformation.

3. Student Engagement

A noticeable transformation in both schools was the heightened student engagement level once teachers contextualized learning through reflective and project-based activities. Students at MI Raudhatul Jannah actively participated in discussions, problem-solving, and reflective sharing. In contrast, students at MI Al Barokah exhibited emotional engagement and pride in connecting classroom learning to their cultural identity. These results are consistent with [Huikku et al., \(2025\)](#) conceptualization of engagement, which includes interdependent behavioral, emotional, and cognitive aspects.

Deep learning theory also supports this outcome: when learning tasks are authentic, personally meaningful, and socially relevant, students demonstrate higher motivation and ownership ([Rohmah et al., 2024](#)). Similarly, [Qin's \(2022\)](#) meta-analytical work emphasizes that the depth of student engagement increases when learners perceive a clear purpose and connection between schoolwork and real life. In the current study, engagement was both behavioral and affective and cultural. Particularly at MI Al Barokah, cultural storytelling and family-based projects enabled students to express identity, empathy, and values in learning contexts.

This finding reinforces [Yuliana \(2024\)](#) and [Isnaeni et al., \(2025\)](#) argument that culturally responsive pedagogy is crucial in sustaining motivation within diverse classrooms. Therefore, educators should view deep learning as cognitive rigor and relational depth, where emotional resonance and personal relevance empower the learning process. Teachers in both schools illustrated how reflection, cultural integration, and contextualized practices transformed passive learners into active participants in constructing meaning.

4. Parental Involvement

The findings revealed divergent patterns of parental engagement across the two schools. At MI Raudhatul Jannah, parents were initially hesitant, perceiving project-based tasks as burdensome or unnecessary. In contrast, at MI Al Barokah, parents gradually became supportive after observing their children's enthusiasm during exhibitions and storytelling sessions. This difference corresponds to the framework of school family community partnerships ([Huikku et al., 2025](#)), which emphasizes communication, visibility, and shared purpose as key determinants of parental cooperation.

Moreover, contemporary studies on deep learning stress that learning partnerships must extend beyond classroom boundaries, integrating parents and communities into the educational process ([Shi et al., 2023](#)). The success of MI Al Barokah in transforming skepticism into participation reflects the importance of transparency and collaboration. When teachers shared project outcomes and invited parents to observe learning activities, trust and mutual understanding grew stronger.

The implication is clear: effective implementation of the Merdeka Curriculum requires schools to reimagine parents not as external evaluators but as co-participants in learning ([Sulistiani & Dewi, 2024](#)). Particularly in Islamic primary schools, this

partnership can be enhanced by connecting learning themes to moral, religious, or community-based values that parents can easily relate to.

5. Resource and Time Constraints

Both institutions encountered significant challenges regarding limited teaching materials, unstable internet connectivity, and insufficient instructional time. These constraints mirror the structural barriers documented in low-resource educational settings worldwide (Wang et al., 2024). However, the teachers in both schools demonstrated remarkable resilience and creativity by reusing materials, creating handmade visuals, and extending learning time beyond single sessions.

MI Raudhatul Jannah teachers integrated digital and printed media pragmatically, while MI Al Barokah teachers relied on local materials, oral storytelling, and recycled artifacts. This aligns with the resourceful pedagogy proposed by Shi et al. (2023) and Isnaeni et al., (2025), which emphasizes leveraging existing community resources and teacher ingenuity to achieve high-impact learning in constrained environments. Regarding time constraints, both schools used flexible scheduling, either extending sessions or simplifying project scope, to maintain meaningful learning without overwhelming students.

The practical implication is that policymakers must recognize time and resource sufficiency as integral components of curriculum reform. Without structural adjustments, deep learning risks remaining aspirational. Nevertheless, the findings affirm that teacher creativity, not technology, is the primary catalyst for sustaining learning quality in rural Islamic contexts.

6. Teacher Leadership Role

Finally, both sites demonstrated the transformative role of teacher leadership in facilitating and sustaining pedagogical change. The teacher leaders did not merely apply new strategies; they also modeled, mentored, and collaborated with colleagues. At MI Raudhatul Jannah, leadership manifested through modeling innovative lessons, while at MI Al Barokah, it took the form of peer reflection and collaborative problem-solving.

This pattern reflects the proposed distributed leadership model (Wijaya, 2025), which posits that school leadership is not confined to formal positions but is shared across members through interaction and shared learning. In Ramadhan & Usriyah, (2021), such leadership fosters collective efficacy, professional trust, and shared accountability. Within this study, teacher leadership served as the bridge between the policy ideals of the Merdeka Curriculum and their classroom realities (Idawati et al., 2024).

These findings contribute to the growing literature on teacher agency and adaptive professionalism, as described by Wang et al. (2024), who argue that genuine reform occurs when teachers act as designers of learning rather than implementers of policy. This underscores the value of investing in teacher empowerment programs such as teacher leaders, which nurture reflective leadership at the grassroots level. Through collaboration, modeling, and reflection, teachers at both madrasahs transformed challenges into opportunities for professional growth and systemic improvement.

The discussion highlights a coherent developmental trajectory across both schools from misconception to mastery, resistance to adaptation, and individual experimentation to collaborative leadership. The findings confirm that deep learning within the Merdeka Curriculum is not primarily about technology, resources, or external training but mindset transformation and contextual innovation. When

teachers are empowered to think critically, reflect collectively, and act adaptively, meaningful and sustained learning becomes possible in seven low-resource Islamic primary schools (Fatimatuzzahro et al., 2022).

This study, therefore, contributes empirical evidence to the discourse on teacher-led deep learning reform in developing contexts, emphasizing that the success of educational transformation depends less on structural provision and more on the professional learning culture that teachers build together. Moreover, the findings offer significant implications for practitioners and policymakers in Islamic education. For madrasah teachers, implementing deep learning within the Merdeka Curriculum requires pedagogical innovation, a reflective attitude, and collaborative engagement to sustain meaningful learning practices. From a policy perspective, the results highlight the urgency of strengthening teacher professional development programs in Islamic schools, aligning them with the principles of adaptive leadership and culturally grounded learning. Such alignment enables madrasah ibtidaiyah to realize the ideals of the Merdeka Curriculum within their distinctive values, traditions, and learning environments.

Conclusion

The study reveals that implementing deep learning within the Merdeka Curriculum in Islamic primary schools involves a transformative process in teachers' understanding and practice. Initially, Teacher Leaders (*Guru Penggerak*) faced conceptual confusion, often equating deep learning with technological sophistication or difficult academic content. Through sustained reflection, mentoring, and peer collaboration, they gradually developed a more accurate and practical comprehension, viewing deep learning as an inquiry-based, reflective, and contextualized process. This internal shift in mindset enabled teachers to design meaningful learning experiences even in resource-limited settings. Their adaptive strategies, such as project-based learning, storytelling, reflective questioning, and cultural integration, effectively localized curriculum principles and fostered genuine student engagement characterized by curiosity, collaboration, and emotional connection.

Furthermore, the study emphasizes the pivotal role of teacher leadership, parental collaboration, and contextual adaptation in sustaining pedagogical transformation. Teacher Leaders acted as catalysts for change, mentoring peers, modeling innovation, and fostering collective reflection, bridging the gap between curriculum policy and classroom realities. Despite structural limitations like limited digital facilities and instructional time, these educators demonstrated that creativity, autonomy, and professional trust are more decisive for educational reform than material resources. Consequently, the success of deep learning in madrasah settings depends on empowering teachers as reflective leaders and adaptive innovators who can translate curriculum ideals into culturally grounded, meaningful classroom practices.

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