



Journal of Deep Learning

<https://journals2.ums.ac.id/index.php/jdl>



Deep Learning as an Integrated Pedagogical Framework: Synthesizing Mindful, Meaningful, and Joyful Learning for Transformative Educational Experiences

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DOI: 10.23917/jdl.v2i2.16008

Received: May 30th, 2026. Revised: July 14th, 2026. Accepted: July 25th, 2026

Available Online: July 31st, 2026. Published Regularly: December, 2026

Abstract

The transformation of 21st-century education requires a shift from knowledge transmission toward learning approaches that emphasize deeper understanding, active engagement, and meaningful experiences. The deep learning approach has emerged as a pedagogical framework that integrates meaningful learning, mindful learning, and joyful learning to develop students' cognitive, affective, and metacognitive dimensions. However, previous studies have often examined these dimensions separately, resulting in limited understanding of their integration within a comprehensive framework. This study aims to analyze the deep learning approach, identify its implementation patterns, challenges, and implications for improving educational quality. A descriptive qualitative approach was employed through literature synthesis, supported by teacher perceptions, classroom observations, and interviews. Data were analyzed using qualitative descriptive analysis and validated through technique triangulation. The findings reveal that deep learning effectively combines meaningful learning as a foundation for conceptual understanding, joyful learning as a driver of engagement, and mindful learning as a mechanism for reflection and metacognitive development. However, implementation remains dominated by meaningful and joyful learning, while mindful learning receives limited attention. This study highlights that the main challenge of deep learning lies in translating its principles into systematic reflective practices. The findings contribute to pedagogical development by emphasizing the importance of balanced integration among the three dimensions to create meaningful, enjoyable, and sustainable learning experiences.

Keywords: deep learning, mindful learning, meaningful learning, joyful learning, pedagogical framework, meaningful experiences, transformative educational

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1. Introduction

The development of 21st-century education requires a fundamental transformation of the learning paradigm from a traditional approach focused on knowledge transmission to one that emphasizes deep conceptual understanding, active student involvement, and

meaningful learning experiences. In contemporary education, learning success is no longer determined solely by students' ability to memorize and reproduce information but also by their capacity to understand concepts, apply knowledge in various contexts, think

critically, and reflect on their learning processes (Nafi'ah & Faruq, 2025). Therefore, educational practices need to simultaneously facilitate students' cognitive, affective, and metacognitive development. The deep learning approach in a pedagogical context is a learning process that fosters comprehensive student engagement through deeper understanding, reflection, and meaningful knowledge construction, rather than temporary or superficial learning outcomes (Feri-yanto & Anjariyah, 2024).

The increasing complexity of global challenges further strengthens the urgency of implementing learning approaches that develop students' critical thinking, creativity, adaptability, and reflective abilities. Educational institutions are expected to prepare learners who are capable of responding to dynamic social, technological, and professional environments. Consequently, learning processes must shift from teacher-centered instruction toward student-centered approaches that encourage exploration, problem-solving, collaboration, and knowledge creation. The implementation of deep learning is considered relevant because it offers opportunities for students to actively engage in the learning process and develop higher-order thinking skills required in the 21st century (Andayanie et al., 2025).

Recent studies indicate that learning approaches grounded in mindful, meaningful, and joyful learning significantly improve student engagement, motivation, and conceptual understanding. Meaningful learning emphasizes the connection between new knowledge and students' prior experiences, enabling learners to understand the relevance of learning materials within real-life contexts (Maknun & Niswar, 2025). Through meaningful learning, students are not merely recipients of information but active participants who con-

struct knowledge based on personal experiences and contextual understanding. This process contributes to stronger knowledge retention and deeper conceptual mastery (Dewi et al., 2025).

Furthermore, joyful learning has an important role in creating a positive emotional learning environment that encourages students' enthusiasm, curiosity, and active participation. A joyful learning atmosphere does not simply focus on entertainment but emphasizes creating psychological conditions that support students' motivation and engagement during learning activities. Positive emotional experiences can strengthen students' intrinsic motivation and encourage them to participate more actively in constructing knowledge (Ramadhan, 2025). Meanwhile, mindful learning contributes to the development of students' awareness, concentration, and reflective abilities. Through mindful learning practices, students become more aware of their thinking processes, learning strategies, and personal development during the learning experience (Eriani et al., 2025). These three dimensions demonstrate that effective learning requires integration between intellectual understanding, emotional engagement, and reflective awareness.

Although previous studies have highlighted the benefits of mindful, meaningful, and joyful learning, research gaps remain regarding the comprehensive integration of these three dimensions within a deep learning framework. Most existing studies examine these approaches separately, either as independent learning strategies or as conceptual discussions, without explaining their interrelationship as an integrated pedagogical framework (Feri, 2025). As a result, there is limited understanding of how deep learning can systematically integrate cognitive, emotional, and metacognitive dimensions to create

meaningful and enjoyable learning experiences (Feriyanto & Anjariyah, 2024). In addition, several previous studies remain dominated by literature-based discussions, resulting in limited conceptual models that explain the practical implications of implementing deep learning in educational contexts (Nafi'ah & Faruq, 2025).

Recent research generally supports the potential of deep learning in improving educational quality through contextual, humanistic, and student-oriented learning experiences (Andayanie et al., 2025). However, previous studies have not sufficiently positioned deep learning as a holistic pedagogical approach that integrates knowledge construction, emotional experience, and self-reflection within a systematic learning design. This limitation indicates the need for further conceptual exploration to strengthen the theoretical foundation of deep learning and its contribution to contemporary educational practices (Azzahra & Jaya, 2025).

Based on these conditions, this research offers novelty by formulating and analyzing deep learning as a pedagogical framework that integrates mindful, meaningful, and joyful learning to support enjoyable, meaningful learning experiences. This study differs from previous research by emphasizing the interconnectedness of cognitive, affective, and metacognitive dimensions as essential components of effective learning. The purpose of this article is to conceptually examine the deep learning approach in education and identify its implications for teaching practices and educational quality improvement. The findings of this study are expected to contribute to pedagogical theory and provide practical guidance for educators and policymakers in designing learning environments that emphasize depth of understanding, student engagement, and meaningful educational experiences.

2. Method

a. Research Design

This study employed a descriptive qualitative case study design to explore the implementation of deep learning in educational practice and to understand teachers' perceptions of meaningful and enjoyable learning experiences. A qualitative approach was selected because it enables researchers to investigate educational phenomena in their natural contexts and obtain comprehensive insights into participants' experiences, perspectives, and interpretations. The case study design was used to provide an in-depth understanding of how deep learning principles, including mindful, meaningful, and joyful learning, are implemented in actual classroom settings (Yin, 2018).

This research focused on examining three main dimensions of deep learning implementation: (1) mindful learning, which relates to students' awareness, attention, and reflection during the learning process; (2) meaningful learning, which refers to students' ability to connect learning materials with prior knowledge and real-life contexts; and (3) joyful learning, which emphasizes positive emotional experiences, motivation, and active engagement during learning activities.

To enhance the study's analytical rigor, a structured analytical framework was developed prior to data collection. This framework operationalized the three core dimensions of deep learning into observable analytical parameters that were used consistently in interpreting questionnaire responses, classroom observations, interview findings, and literature evidence. The analytical framework enabled the researchers to classify evidence systematically and identify recurring implementation patterns across different educational contexts.

b. Analytical Framework and Research Parameters

The analytical framework was developed based on the conceptual model of deep learning, which consists of three interrelated dimensions: Meaningful Learning, Joyful Learning, and Mindful Learning. Each dimension was translated into analytical indicators adapted from previous studies (Creswell & Poth, 2018). Rather than functioning as quantitative measurement variables, these indicators served as coding categories during data reduction and thematic analysis. Similar evidence was grouped into categories before being synthesized into broader implementation themes presented in the Results and Discussion.

c. Data Collection Techniques

Data were collected through teacher questionnaires, classroom observations, and semi-structured interviews. The combination of these techniques was used to obtain comprehensive data and capture both measurable trends and contextual information about the implementation of deep learning (Rakhmadi et al., 2026).

Teacher questionnaires consisted of closed and open-ended questions designed to identify teachers' understanding, perceptions, and experiences regarding the implementation of deep learning approaches in classroom activities. The questionnaire gathered information about teachers' perspectives on applying mindful, meaningful, and joyful learning principles. The use of questionnaires in qualitative research can support the identification of participants' views and provide initial descriptions of research phenomena (Creswell & Poth, 2018).

The questionnaire was designed to obtain descriptive information about teachers' perceptions of deep learning implementation rather than to test hypotheses. The questionnaire

items were organized according to the three analytical dimensions of deep learning, allowing the responses to complement classroom observations, interview findings, and evidence identified from the reviewed literature.

Classroom observations were conducted during learning activities to examine the implementation of deep learning principles in practice. The observation focused on learning interactions, student engagement, teacher instructional strategies, classroom atmosphere, and the extent to which learning activities reflected mindful, meaningful, and joyful learning characteristics. Direct observation allows researchers to understand educational practices based on naturally occurring classroom situations rather than relying solely on participants' reports (Cohen et al., 2018).

Semi-structured interviews were conducted with teachers to obtain deeper insights into their experiences, challenges, strategies, and reflections on implementing deep learning approaches. Interviews enabled researchers to explore participants' perspectives more comprehensively and identify contextual factors influencing the implementation of deep learning in classroom practices (Kvale & Brinkmann, 2015).

d. Data Analysis Techniques

The collected data were analyzed using qualitative descriptive analysis. Responses to closed-ended questions were analyzed descriptively through categorization and percentage calculations to identify general patterns in teachers' perceptions of deep learning implementation (Siregar et al., 2025). Meanwhile, responses to open-ended questions, observational findings, and interview transcripts were analyzed qualitatively.

During data analysis, all qualitative evidence was coded according to the predefined analytical framework. Similar codes were

merged into thematic categories representing implementation characteristics, implementation patterns, influencing factors, and educational implications. These thematic categories

formed the basis for the synthesis matrices presented in Table 1.

Table 1. Analytical Framework and Research Parameters

Dimension	Parameter	Analytical Indicators
Meaningful Learning	Cognitive engagement	Contextual learning; knowledge construction; prior knowledge activation; authentic problem solving
Joyful Learning	Emotional engagement	Positive classroom atmosphere; collaboration; participation; motivation; active interaction
Mindful Learning	Reflective engagement	Reflection; metacognition; self-regulation; learning awareness; self-assessment

The qualitative analysis process followed three main stages: data reduction, data presentation, and conclusion drawing. Data reduction involved selecting, organizing, and categorizing relevant information obtained from observations and interviews. The reduced data were then presented in thematic categories to identify important patterns related to deep learning implementation. Finally, conclusions were drawn by interpreting the identified themes and relating them to the conceptual framework of deep learning, particularly the integration of mindful, meaningful, and joyful learning principles.

e. Data Validity and Trustworthiness

To ensure the validity and trustworthiness of the research findings, this study applied data triangulation by comparing data obtained from questionnaires, classroom observations, and interviews. Triangulation was

employed to enhance the credibility of qualitative findings by examining the consistency of information across different data sources. Furthermore, the researcher conducted repeated reviews of observation records and interview results to ensure that the interpretations accurately represented the collected data.

Through this validation process, the study aimed to minimize researcher bias and strengthen the reliability of the findings. The consistency among teachers' perceptions, observed classroom practices, and interview explanations provided a more comprehensive understanding of how the deep learning approach was implemented to create meaningful and enjoyable learning experiences.

The complete flow of this research is presented in Figure 1.

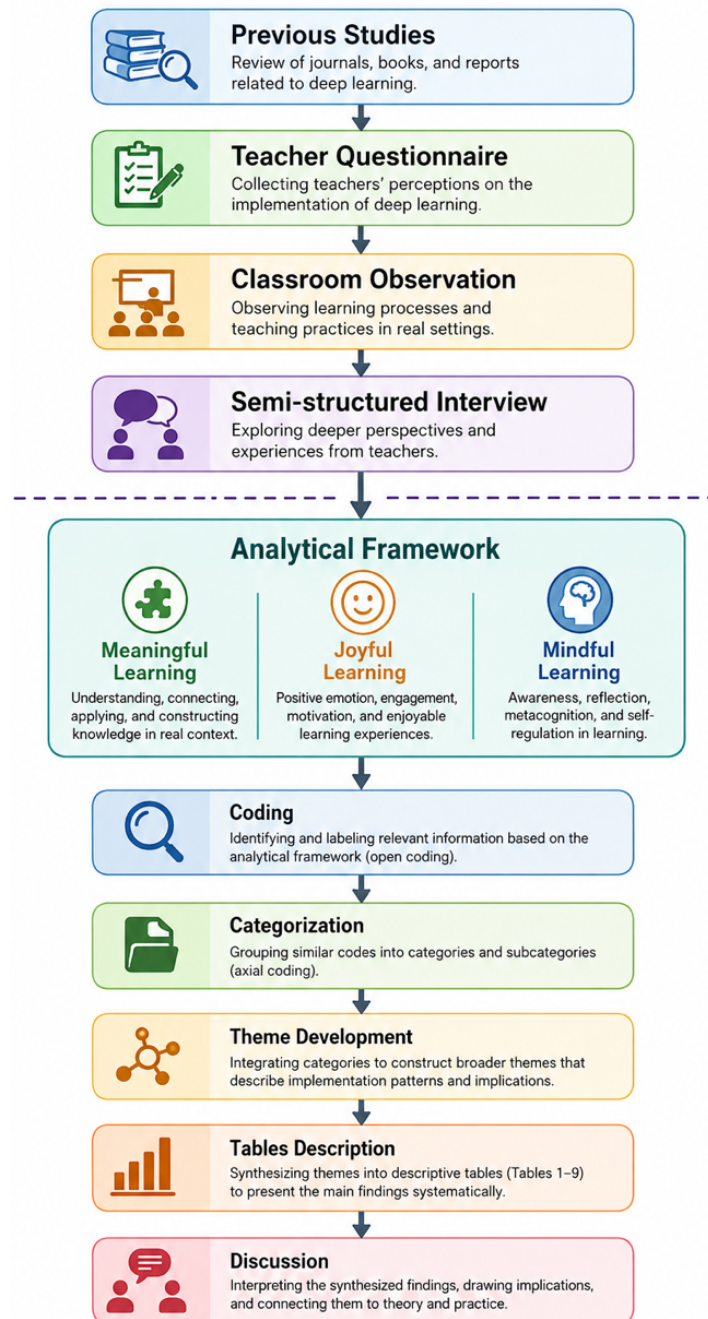


Figure 1. Research Flow

3. Result and Discussion

The findings of this study reveal that implementing deep learning in education is a complex pedagogical process that goes beyond the mere application of individual learning strategies. Based on a synthesis of previous studies, deep learning is positioned as an integrated learning framework that combines cognitive understanding, emotional engage-

ment, and reflective awareness through meaningful, mindful, and joyful learning. The analysis demonstrates that these three dimensions play complementary roles in creating learning experiences that are not only relevant and enjoyable but also encourage students to develop a deeper understanding and awareness of learning.

Furthermore, the findings indicate that although deep learning has received increasing attention in educational research, its implementation in practice still faces several challenges. The reviewed studies show that educators tend to prioritize meaningful and joyful learning aspects because they are more directly observable and easier to integrate into classroom activities (Rahmawati et al., 2025). Meanwhile, the reflective dimension, represented by mindful learning, remains less developed, resulting in an imbalance in the implementation of the three fundamental pillars of deep learning. This condition highlights the gap between the theoretical ideal of deep learning and its practical realization in educational contexts.

The discussion of these findings is organized into three main themes. The first theme examines deep learning as an integrated pedagogical framework that connects the dimensions of meaningful, mindful, and joyful learning. The second theme analyzes the implementation patterns and challenges of deep learning, particularly the dominance of meaningful and joyful learning compared with the limited integration of mindful learning. The third theme discusses the implications of deep learning implementation for improving educational quality and provides directions for future learning development and research.

a. Deep Learning Approach as an Integrated Pedagogical Framework

The synthesis results indicate that the deep learning approach is increasingly positioned as an integrated pedagogical frame-

work that goes beyond conventional instructional practices focused only on knowledge acquisition. Deep learning emphasizes constructing knowledge through active involvement, contextual understanding, emotional engagement, and continuous reflection. Based on analyses of previous studies, deep learning is consistently associated with the integration of three fundamental dimensions: meaningful learning, mindful learning, and joyful learning. These three dimensions represent interconnected components that support the development of students' cognitive, affective, and metacognitive capacities.

The findings demonstrate that meaningful learning serves as the cognitive foundation of deep learning by enabling students to connect new knowledge to prior experiences and real-world contexts. Through meaningful learning activities, students are encouraged to understand concepts rather than merely memorize information. This approach strengthens knowledge construction by making learning materials personally relevant and applicable to students' daily lives. Previous studies confirm that meaningful learning significantly improves conceptual understanding, knowledge retention, and students' ability to apply knowledge in different situations (Ramadhan, 2025). Therefore, meaningful learning represents an essential component in transforming learning from a passive process into an active process of knowledge creation.

The integration of meaningful learning within the deep learning framework can be observed through several implementation characteristics identified from previous studies, as presented in Table 2.

Table 2. Characteristics of Meaningful Learning Implementation as a Component of Deep Learning

No	Learning Dimension	Implementation Characteristics	Learning Process Indicator	Expected Learning Outcomes
1	Contextual Understanding	Learning materials are connected with students' experiences and real-life situations	Students relate concepts with authentic problems	Improved conceptual understanding and knowledge relevance
2	Knowledge Construction	Students actively build understanding through exploration and discussion	Students participate in inquiry-based activities	Increased critical thinking and problem-solving ability
3	Prior Knowledge Activation	Teachers facilitate connections between new concepts and previous knowledge	Students reflect on existing understanding before learning new materials	Stronger cognitive connections and knowledge retention
4	Application-Oriented Learning	Students apply concepts to solve contextual problems	Learning activities involve projects, cases, or real-world tasks	Development of transferable knowledge and skills

Table 2 shows that meaningful learning is the primary mechanism for fostering deeper cognitive engagement in the deep learning approach. The findings show that meaningful learning is not limited to presenting contextual examples but involves a systematic process of connecting prior knowledge, constructing new understanding, and applying knowledge in authentic situations. This pattern explains why meaningful learning is frequently identified as the most dominant element in deep learning implementation. Educators tend to adopt meaningful learning because its principles are relatively easier to translate into classroom practices through contextual assignments, problem-based activities, and real-world examples (Hania et al., 2025). However, the findings also indicate that meaningful learning alone is insufficient to achieve complete deep learning because cognitive relevance needs to be complemented by emotional engagement and reflective awareness.

In addition to the cognitive dimension, the findings reveal that joyful learning plays an important role in strengthening the affective dimension of deep learning. Joyful learning fosters a supportive psychological environment in which students feel comfortable, motivated, and willing to actively participate in the learning process. The presence of positive emotions during learning activities contributes to increased curiosity, confidence, and interaction between students and teachers. Recent studies highlight that enjoyable learning experiences positively influence student motivation and engagement because emotional factors significantly affect the quality of learning processes (Maknun & Niswar, 2025).

The relationship between joyful learning and the implementation of deep learning can be summarized from the patterns identified in the reviewed studies, as shown in Table 3.

Table 3. Role of Joyful Learning in Supporting Deep Learning Implementation

No	Joyful Learning Aspect	Classroom Implementation	Student Response	Contribution to Deep Learning
1	Positive Learning Atmosphere	Teachers create interactive and supportive classroom environments	Students demonstrate enthusiasm and confidence	Strengthens emotional engagement

No	Joyful Learning Aspect	Classroom Implementation	Student Response	Contribution to Deep Learning
2	Active Participation	Learning activities use collaboration, games, and discussions	Students participate actively in learning activities	Encourages student-centered learning
3	Learning Motivation	Teachers provide meaningful encouragement and feedback	Students show persistence and curiosity	Increases intrinsic motivation
4	Social Interaction	Students collaborate and communicate during learning activities	Improved communication and cooperation	Supports collaborative knowledge construction

Table 3 indicates that joyful learning serves as an emotional catalyst, enabling students to engage more deeply with learning activities. The findings suggest that enjoyable learning is not merely entertainment-oriented instruction but rather the creation of meaningful emotional experiences that support cognitive development. When students experience positive emotions, they are more likely to participate actively, explore ideas, and develop confidence in expressing their perspectives. Thus, joyful learning enhances the effectiveness of meaningful learning by creating conditions in which students are psychologically prepared to construct knowledge (Nafi'ah & Faruq, 2025). Nevertheless, the analysis reveals that joyful learning requires reflective activities to ensure that active participation leads to deeper understanding rather than mere temporary enjoyment.

The third dimension identified in this study is mindful learning, which represents the reflective and metacognitive foundation of deep learning. Unlike meaningful and joyful learning, mindful learning receives comparatively less attention in educational implementation. Mindful learning emphasizes students' awareness of their learning processes, including the ability to monitor their understanding, evaluate their learning strategies, and reflect on their experiences (Eriani et al., 2025). This dimension is essential because deep learning requires students not only to understand and enjoy learning but also to recognize how they learn and improve their learning approaches.

The integration of the three dimensions within the deep learning framework is summarized in Table 4.

Table 4. Integration of Meaningful, Mindful, and Joyful Learning within Deep Learning Framework

Dimension	Primary Focus	Learning Activities	Student Competencies Developed	Position in Deep Learning Framework
Meaningful Learning	Cognitive understanding and contextual relevance	Problem-solving, contextual projects, knowledge connection	Conceptual understanding and application skills	Cognitive foundation
Mindful Learning	Awareness and reflection of learning processes	Self-reflection, learning evaluation, metacognitive activities	Self-regulation and reflective thinking	Metacognitive foundation
Joyful Learning	Emotional engagement and positive learning experiences	Collaboration, interactive activities, supportive environment	Motivation, confidence, and participation	Affective foundation
Integrated Deep Learning	Balance between cognition, emotion, and reflection	Holistic learning design combining three dimensions	Comprehensive learning competence	Complete pedagogical framework

Table 4 demonstrates that deep learning can be achieved only when meaningful, mindful, and joyful learning are implemented as interconnected dimensions rather than independent strategies. Meaningful learning provides students with conceptual depth, joyful learning strengthens emotional involvement, while mindful learning ensures that students develop awareness and reflection regarding their learning processes. The findings support previous studies stating that deep learning requires simultaneous engagement of cognitive, affective, and metacognitive aspects (Feri-yanto & Anjariyah, 2024). Without mindful learning, educational activities may be contextual and enjoyable but remain limited in their capacity to develop students' reflective skills.

Overall, the results indicate that deep learning should be understood as a holistic pedagogical framework rather than a single instructional method. The integration of meaningful, mindful, and joyful learning provides a comprehensive foundation for creating learning experiences that are relevant, engaging, and transformative. This finding reinforces previous research suggesting that deep learning significantly improves the quality of learning through contextual, participatory, and humanistic educational practices (Anda-yanie et al., 2025). However, the findings also emphasize that strengthening reflective learning practices remains critical to ensuring that deep learning achieves its intended purpose: developing learners who are not only knowledgeable but also aware, independent, and capable of continuously improving their learning processes.

b. Implementation Patterns and Challenges of Deep Learning

The findings of this study reveal that although the deep learning approach has been

widely recognized as an effective pedagogical framework, its implementation in educational practice still varies significantly in depth and comprehensiveness. The synthesis of previous studies indicates that educators generally understand the importance of creating meaningful and engaging learning experiences; however, the integration of the three essential pillars of deep learning meaningful learning, mindful learning, and joyful learning has not yet been implemented in a proportional manner (Dewi et al., 2025). The dominant pattern identified in the literature is the stronger emphasis on meaningful and joyful learning, while mindful learning remains relatively underdeveloped in classroom practices.

This condition indicates an implementation gap between the theoretical framework of deep learning and its practical realization. Conceptually, deep learning requires a balanced integration of cognitive, affective, and metacognitive dimensions. However, classroom practices often prioritize observable learning outcomes, student participation, and positive classroom environments, while reflective processes that develop students' awareness of their own learning remain limited (Ricita et al., 2025). Previous studies have similarly reported that educational practices tend to emphasize contextual learning and student engagement but provide less structured opportunities for reflection and metacognitive development (Feri, 2025).

The analysis of reviewed studies identified several recurring implementation patterns of deep learning in educational contexts. These patterns demonstrate that meaningful learning and joyful learning are generally more frequently adopted because they are easier to translate into instructional strategies, whereas mindful learning requires more deliberate pedagogical planning. The implementation patterns are presented in Table 5.

Table 5. Implementation Patterns of Deep Learning Components in Educational Practices

No	Deep Learning Component	Common Implementation Practices	Level of Implementation	Main Challenges
1	Meaningful Learning	Contextual examples, project-based learning, real-life problem solving	High	Maintaining consistency across different learning contexts
2	Joyful Learning	Interactive activities, collaboration, educational games, positive classroom atmosphere	High	Avoiding activities that focus only on enjoyment without depth
3	Mindful Learning	Reflection activities, self-assessment, learning evaluation	Moderate to Low	Limited reflective practices and metacognitive strategies
4	Integrated Deep Learning	Combination of cognitive, emotional, and reflective activities	Limited	Difficulty designing comprehensive learning frameworks

Table 5 illustrates that meaningful learning represents the strongest component in deep learning implementation. Teachers tend to adopt contextual approaches because they can be directly connected with curriculum objectives and students' daily experiences. Similarly, joyful learning receives considerable attention because creating an enjoyable classroom environment is closely associated with increasing student motivation and participation (Suryadi et al., 2026). However, the table also highlights that mindful learning remains the weakest dimension due to the complexity of integrating reflective activities into regular classroom practices. Unlike meaningful and joyful learning, which can be observed through visible classroom activities, mindful learning requires deeper attention to students' internal learning processes, including awareness, self-regulation, and reflection (Asminarseh & Widiyanto, 2025). Therefore, the imbalance among these components becomes one of the main challenges in achieving authentic deep learning.

The dominance of meaningful and joyful learning also reflects broader challenges educators face in designing learning activities that simultaneously address cognitive and metacognitive development. Many teachers

have successfully implemented active and engaging learning strategies; however, these strategies do not always encourage students to critically evaluate their own understanding or learning progress (Latifah & Irawan, 2025). As a result, learning activities may achieve high levels of participation but remain limited in their ability to develop deeper learning awareness. This finding supports previous research indicating that deep learning implementation often encounters challenges not because educators reject the concept, but because reflective learning has not yet become an established classroom habit (Diputera et al., 2024).

The limited integration of mindful learning can be further understood by examining the differences between visible classroom engagement and deeper cognitive transformation. Student activity, enthusiasm, and interaction are important indicators of effective learning, but they do not automatically indicate that meaningful learning has occurred. Deep learning requires students to consciously understand what they learn, why they learn it, and how they can improve their learning strategies. The comparison between surface engagement and deep learning characteristics is presented in Table 6.

Table 6. Comparison between Surface Learning Engagement and Deep Learning Practices

Dimension	Primary Focus	Learning Activities	Student Competencies Developed
Knowledge Acquisition	Memorizing information and reproducing concepts	Understanding concepts and constructing knowledge	Improved conceptual mastery
Student Participation	Following instructions and completing tasks	Actively exploring, questioning, and reflecting	Higher learning autonomy
Learning Motivation	Mainly influenced by external factors	Driven by curiosity and personal relevance	Sustainable engagement
Reflection Process	Limited evaluation of learning experiences	Continuous self-assessment and improvement	Development of metacognitive awareness

Table 6 shows that the distinction between surface learning and deep learning is not merely about the amount of student activity but about the quality of cognitive and reflective engagement. A classroom may appear active and enjoyable yet remain at a superficial level if students are not encouraged to analyze, evaluate, and reflect on their learning experiences (Resa et al., 2025). Therefore, the implementation of mindful learning is essential for transforming active participation into meaningful intellectual development. The findings emphasize that deep learning should be measured not only by behavioral indicators such as participation or classroom enthusiasm but also by students' ability to monitor and regulate their own learning processes.

Another important finding concerns the factors influencing the imbalance of deep learning implementation. The analysis indicates that several pedagogical and contextual factors contribute to the limited application of mindful learning, including teachers' instructional design capabilities, limited time allocation, curriculum demands, and the availability of assessment instruments that measure reflective learning (Romli et al., 2026). While teachers generally understand the importance of deep learning principles, translating these principles into systematic classroom activities remains challenging. The influencing factors and their implications are summarized in Table 7.

Table 7. Factors Influencing the Implementation Challenges of Deep Learning

No	Influencing Factor	Current Condition	Impact on Deep Learning Implementation	Required Improvement
1	Teacher Competence	Understanding of deep learning concepts varies among educators	Unequal quality of implementation	Professional development and training
2	Learning Design	Reflection activities are not systematically included	Limited development of metacognitive skills	Integration of reflective learning stages
3	Assessment System	Focus remains on cognitive achievement	Reflective learning outcomes are less measured	Development of comprehensive assessment instruments
4	Classroom Constraints	Limited time and diverse student characteristics	Difficulties in implementing holistic learning	Flexible and adaptive learning strategies

Table 7 indicates that the challenges of deep learning implementation are primarily

pedagogical rather than conceptual. The main issue is not the lack of awareness regarding

deep learning principles but the difficulty of transforming these principles into structured instructional practices. Teacher competence becomes a critical factor because educators play a central role in designing learning experiences that integrate cognition, emotion, and reflection (Hardini et al., 2026). Furthermore, assessment systems that predominantly measure cognitive achievement may discourage teachers from implementing reflective activities, as these outcomes are more difficult to evaluate. Therefore, improving deep learning implementation requires not only teacher training but also curriculum development and assessment reform that recognize metacognitive and affective learning outcomes.

In the context of Indonesian education, these findings are particularly relevant because deep learning has increasingly become a focus of discussions on improving learning quality and educational innovation, including its relationship to the implementation of the Merdeka Curriculum (Kuo et al., 2024). The results of this study support this direction while emphasizing that policy adoption alone is insufficient without strengthening teachers' capacity to design reflective and meaningful learning experiences.

Compared with previous studies that primarily discuss deep learning from a conceptual perspective, this research contributes by identifying recurring implementation patterns and highlighting the imbalance among the three pillars of deep learning. The findings support previous research on the effectiveness of meaningful and joyful learning and extend the discussion by emphasizing mindful learning as a critical yet frequently overlooked component (Andayanie et al., 2025).

Overall, the results indicate that the primary challenge in implementing deep learning is not understanding the concept but achieving a balanced integration of meaning-

ful, mindful, and joyful learning. Learning environments may already be contextual and enjoyable, but without systematic reflection, students' learning experiences may remain at the level of engagement rather than transformation (Fitri et al., 2026). Therefore, strengthening mindful learning practices is a strategic priority to ensure that deep learning achieves its ultimate goal: developing learners who are knowledgeable, reflective, autonomous, and capable of continuously improving their learning processes.

c. Implications of Deep Learning for Improving Educational Quality and Future Learning Development

The findings of this study provide important implications for the development of educational practices, particularly in designing learning environments that emphasize depth of understanding, student engagement, and reflective learning experiences. The synthesis results indicate that deep learning should not be viewed merely as an instructional technique but as a comprehensive pedagogical framework that has the potential to transform the quality of learning (Andayanie et al., 2025). The integration of meaningful, mindful, and joyful learning provides a foundation for developing educational practices that simultaneously address cognitive, affective, and metacognitive dimensions.

From a theoretical perspective, this study contributes to strengthening the understanding that effective learning quality is determined not only by students' academic achievement but also by the quality of their learning experiences. Previous studies have emphasized that deep learning can improve conceptual understanding and student engagement when learning activities are designed to be contextual, collaborative, and reflective (Feriyanto & Anjariyah, 2024). The

findings of this study extend these perspectives by highlighting that the sustainability of deep learning implementation depends on the balanced integration of its three fundamental components. Without meaningful learning, students may struggle to connect knowledge to real-world contexts; without joyful learning, students may lack motivation and emotional

engagement; and without mindful learning, students may fail to develop awareness of their own learning processes (Dewi et al., 2026).

The implications of deep learning implementation for educational quality improvement can be categorized into several dimensions, as presented in Table 8.

Table 8. Implications of Deep Learning Implementation for Educational Quality Improvement

No	Educational Dimension	Contribution of Deep Learning	Expected Improvement	Strategic Implication
1	Learning Process	Integrates cognitive, affective, and metacognitive aspects	More meaningful and engaging learning experiences	Development of student-centered learning models
2	Student Competence	Strengthens critical thinking, creativity, and reflection	Development of 21st-century skills	Preparation of adaptive and independent learners
3	Teacher Practice	Encourages innovative and reflective instructional design	Improved teaching quality and pedagogical competence	Continuous professional development
4	Educational Policy	Provides a framework for holistic learning transformation	Improved learning quality standards	Integration into curriculum and educational programs

Table 8 demonstrates that deep learning has broad implications beyond classroom activities because it influences multiple dimensions of educational quality. At the level of the learning process, deep learning encourages a shift from knowledge transmission to knowledge construction, in which students actively participate in developing their understanding. At the student level, the approach supports the development of essential 21st-century competencies, including critical thinking, creativity, problem-solving, and self-regulated learning (Wulansari et al., 2025). Furthermore, deep learning also requires teachers to redesign instructional practices by incorporating contextual activities and reflective processes. Therefore, the implementation of deep learning has implications not only for students but also for teacher professional development and educational policy formulation.

From a practical perspective, the findings suggest that educators need to redesign learning activities by systematically incorporating the three pillars of deep learning. Current learning practices often emphasize contextual activities and student participation; however, the reflective dimension requires greater attention. Teachers need to develop learning scenarios that provide opportunities for students to evaluate their understanding, identify learning difficulties, and formulate strategies for improvement (Nurohmah et al., 2026). Such practices can strengthen students' metacognitive abilities and transform learning from a passive experience into an active, continuous process of development.

The role of teachers in implementing deep learning is therefore highly strategic. Teachers are not only facilitators of knowledge but also designers of learning experiences that encourage exploration, reflection,

tion, and meaningful interaction. The competencies required for deep learning implementation are summarized in Table 9.

Table 9. Required Teacher Competencies for Effective Deep Learning Implementation

No	Teacher Competency	Description	Relationship with Deep Learning	Development Strategy
1	Instructional Design Competence	Ability to design contextual and reflective learning activities	Supports meaningful and mindful learning integration	Training on deep learning-based lesson planning
2	Facilitation Competence	Ability to guide active student participation	Strengthens joyful and collaborative learning	Development of student-centered teaching strategies
3	Assessment Competence	Ability to evaluate cognitive, affective, and reflective outcomes	Ensures balanced measurement of learning achievement	Development of authentic assessment instruments
4	Reflective Teaching Competence	Ability to evaluate and improve teaching practices	Supports continuous improvement of learning quality	Teacher reflection and professional learning communities

Table 9 highlights that teacher competence represents a central determinant of successful deep learning implementation. Although deep learning provides a strong conceptual framework, its effectiveness depends on teachers' ability to translate theoretical principles into concrete classroom practices. Instructional design competence enables teachers to create learning activities that connect concepts with real-world contexts, while facilitation competence supports active and enjoyable learning experiences (Dewi et al., 2026). Moreover, assessment competence becomes increasingly important because conventional assessment systems often focus primarily on cognitive outcomes and do not sufficiently capture students' reflection and

learning awareness. Therefore, strengthening teacher capacity should become a major priority in educational transformation efforts.

In addition to implications for teachers and classroom practices, this study also provides directions for future educational development and research. The findings indicate that future initiatives should focus on developing systematic models, instruments, and policies that support balanced implementation of meaningful, mindful, and joyful learning. In particular, mindful learning warrants further exploration, as it is the dimension most frequently overlooked despite its importance in developing autonomous and reflective learners. The potential directions for future development are presented in Table 10.

Table 10. Future Development Directions for Deep Learning Research and Practice

No	Development Area	Current Limitation	Future Research Direction	Expected Contribution
1	Learning Model Development	Limited integrated deep learning models	Development of comprehensive instructional frameworks	More effective classroom implementation
2	Assessment Instrument Development	Lack of instruments measuring reflective learning	Creation of multidimensional assessment tools	Better evaluation of deep learning outcomes
3	Teacher Professional Development	Unequal teacher readiness	Development of continuous training programs	Increased implementation consistency

No	Development Area	Current Limitation	Future Research Direction	Expected Contribution
4	Educational Policy Development	Limited operational guidelines	Formulation of implementation strategies	Sustainable educational transformation

Table 10 indicates that future development of deep learning requires a multidimensional approach involving research, practice, and policy. The development of learning models and assessment instruments is particularly important because deep learning requires evaluation beyond traditional academic achievement (Nafi'ah & Faruq, 2025). Instruments that measure students' reflection, self-regulation, and learning awareness are needed to capture the full impact of deep learning implementation. Furthermore, teacher professional development programs should focus not only on introducing the concept of deep learning but also on providing practical strategies for designing and evaluating deep learning activities. These efforts will help ensure that deep learning becomes a sustainable educational practice rather than merely a temporary instructional trend.

In the Indonesian educational context, these implications are aligned with current efforts to improve learning quality through curriculum innovation, including the implementation of the Merdeka Curriculum, which emphasizes student-centered learning, contextual experiences, and competency development (Simanullang, 2025). However, the findings of this study indicate that policy-level support must be accompanied by strengthening implementation capacity at the classroom level. Teachers require adequate support, resources, and professional development opportunities to ensure that deep learning principles can be applied effectively.

Compared with previous studies that primarily discuss the conceptual importance of deep learning, this research provides addi-

tional insight by identifying practical implications derived from recurring implementation patterns across educational contexts (Andayani et al., 2025). The study supports previous findings on the contribution of meaningful and joyful learning and expands the discussion by emphasizing the strategic role of mindful learning as a foundation for reflective and sustainable learning.

Overall, the findings demonstrate that deep learning has significant potential to improve educational quality by creating learning experiences that are meaningful, engaging, and transformative. However, achieving optimal implementation requires a balanced integration of meaningful, mindful, and joyful learning. Future educational development should therefore focus on strengthening reflective learning practices, improving teacher competence, and developing comprehensive evaluation systems. Through these efforts, deep learning can contribute to the development of learners who are not only academically competent but also reflective, adaptive, and capable of continuous learning in a rapidly changing world.

4. Conclusion

This study concludes that the deep learning approach constitutes an integrated pedagogical framework that enhances educational quality through the balanced implementation of meaningful, joyful, and mindful learning. The findings indicate that meaningful and joyful learning have been implemented more consistently, contributing to contextual understanding, student engagement, and motivation to learn, whereas mindful learning remains relatively underdeveloped, particularly

in fostering reflection and metacognitive awareness. These results suggest that the primary challenge lies not in understanding deep learning but in translating it into systematic pedagogical practices that effectively integrate reflective activities and self-regulated learning. Therefore, successful implementation of deep learning requires balanced attention to its cognitive, affective, and reflective dimensions through appropriate learning design, teacher professional development, and assessment practices, enabling students to develop deeper understanding, greater learning autonomy, and sustainable lifelong learning competencies.

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