Teachers' Understanding and Attitudes to the Application of Deep Learning in the Independent Curriculum: A Case Study

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Abstract
Deep learning is a learning approach that emphasizes meaningful understanding through mindful, meaningful, and joyful processes. This study aims to explore teachers' understanding and attitudes towards the application of deep learning in the Independent Curriculum in elementary schools. The qualitative research of this case study was carried out at SDN Pajaran 04, a favorite school with complete facilities where all teachers have participated in the Independent Curriculum training. The research subjects consisted of 8 teachers and 1 principal. Data were collected through in-depth interviews, observations, and documentation, then analyzed using the Miles and Huberman model. The results of the study show that: (1) teachers' understanding of the concept of deep learning still varies, with most teachers understanding deep learning as active learning but not fully understanding the essence of conscious learning; (2) teachers' attitudes are generally positive towards the application of deep learning, although there are concerns related to administrative burden and preparation time; (3) Factors supporting implementation include the support of the principal, the availability of facilities, and collaboration between teachers. This study concludes that a deep conceptual understanding and positive attitude of teachers are the key to the successful implementation of deep learning in the Independent Curriculum.
Keywords: deep learning, independent curriculum, teacher understanding, teacher attitude, elementary school

Abstrak
Deep learning merupakan pendekatan pembelajaran yang menekankan pemahaman bermakna melalui proses yang penuh kesadaran (mindful), bermakna (meaningful), dan menyenangkan (joyful). Penelitian ini bertujuan mengeksplorasi pemahaman dan sikap guru terhadap penerapan deep learning dalam Kurikulum Merdeka di sekolah dasar. Penelitian kualitatif studi kasus ini dilaksanakan di SDN Pajaran 04, sekolah favorit dengan fasilitas lengkap yang seluruh gurunya telah mengikuti pelatihan Kurikulum Merdeka. Subjek penelitian terdiri dari 8 guru dan 1 kepala sekolah. Data dikumpulkan melalui wawancara mendalam, observasi, dan dokumentasi, kemudian dianalisis menggunakan model Miles dan Huberman. Hasil penelitian menunjukkan bahwa: (1) pemahaman guru terhadap konsep deep learning masih bervariasi, sebagian besar guru memahami deep learning sebagai pembelajaran aktif namun belum sepenuhnya memahami esensi pembelajaran yang penuh kesadaran (mindful learning); (2) sikap guru secara umum positif terhadap penerapan deep learning, meskipun terdapat kekhawatiran terkait beban administratif dan waktu persiapan; (3) faktor pendukung implementasi meliputi dukungan kepala sekolah, ketersediaan fasilitas, dan kolaborasi antar guru. Penelitian ini menyimpulkan bahwa pemahaman konseptual yang mendalam dan sikap positif guru merupakan kunci keberhasilan implementasi deep learning dalam Kurikulum Merdeka.
Kata kunci: deep learning, kurikulum merdeka, pemahaman guru, sikap guru, sekolah dasar

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INTRODUCTION

Deep learning has become a central concept in global education reform as countries seek to move beyond surface-level memorization toward meaningful understanding and higher-order thinking (Fullan et al., 2018). Internationally, deep learning is recognized as an approach that fosters students' capacity to engage in critical thinking, collaboration, creativity, and metacognitive awareness, which are essential competencies for the 21st century (Mehta & Fine, 2019). In the Indonesian context, the urgency of adopting deep learning is reflected in the Merdeka Curriculum launched by the Ministry of Education, Culture, Research, and Technology, which mandates a shift toward more meaningful and student-centered learning as stipulated in Permendikbudristek Number 12 of 2024 (Rahmadayanti & Hartoyo, 2022). The concept of deep learning thus serves as one of the key approaches in implementing the Independent Curriculum in Indonesia.

The concept of deep learning in education has its roots in the research of Marton and Säljö (1976) which categorizes students' learning approaches into two levels: surface processes that emphasize memorization without understanding, and deep processes that emphasize understanding meaning and relating to prior knowledge. Anderson and Krathwohl (2001) in their revision of Bloom's Taxonomy define understanding as the ability to construct meaning through seven cognitive processes: interpreting, exemplifying, classifying, summarizing, inferring, comparing, and explaining.

In the context of the Indonesian Merdeka Curriculum, deep learning is operationalized through three main pillars: mindful learning, meaningful learning, and joyful learning. Mindful learning refers to full awareness, focus, and active involvement in the learning process that involves metacognition. Meaningful learning as proposed by Ausubel and developed by Bryce and Blown (2024) emphasizes the ability to apply knowledge to real-life situations. Meanwhile, joyful learning creates a positive learning atmosphere that motivates students (Indarta et al., 2022).

The implementation of deep learning in the Independent Curriculum requires a paradigm shift from teachers. Teachers no longer play the role of the only source of knowledge, but rather as facilitators who guide students in constructing their own understanding (Sumarsih et al., 2022). This change in role requires teachers to have a comprehensive understanding of the concept of deep learning as well as a positive attitude towards its application. As stated by Ajzen (1991) in the Theory of Planned Behavior, attitudes towards a behavior will affect the intention and ultimately the behavior itself.

Several previous studies have examined the implementation of the Independent Curriculum in various contexts. Febrianningsih and Ramadan (2023) found that teachers' readiness in the implementation of the Independent Curriculum is influenced by conceptual understanding and institutional support. Meanwhile, Sunarni and Karyono (2023) reported that teachers' perceptions of the new curriculum vary greatly depending on teaching experience and access to training. Sumarsih et al. (2022) analyzed the implementation process at driving schools but focused on managerial aspects rather than pedagogical understanding. However, these studies primarily examined teachers' readiness and perceptions of the Independent Curriculum in general, without specifically investigating how teachers understand and apply the concept of deep learning—particularly the three pillars of mindful, meaningful, and joyful learning. This gap is significant because deep learning requires not only a positive attitude but also a deep conceptual understanding that goes beyond active learning methods. Therefore, this study addresses this research gap by specifically exploring teachers' understanding of deep learning concepts, their attitudes toward its application, and the supporting and inhibiting factors in implementation.

This study aims to answer the following questions: (1) How do SDN Pajaran 04 teachers understand the concept of deep learning in the Independent Curriculum? (2) What is the teacher's attitude towards the application of deep learning? (3) What factors support and hinder the implementation of deep learning in the school.

METHODS

Research design

This study uses a qualitative approach with a case study design. According to Yin (2018), case studies are in-depth empirical investigations of contemporary phenomena in real-life contexts. Stake (1995) emphasizes that case studies focus on the particularity and complexity of the case in order to understand its activity in a given situation. This research is included in the single instrumental case study category because it focuses on one school to understand the phenomenon of teachers' understanding and attitudes towards deep learning.

Participants

The research participants consisted of 8 classroom and subject teachers and 1 principal at SDN Pajaran 04. The selection of participants is carried out purposively with the following criteria: (1) have participated in the Independent Curriculum training, (2) actively taught for at least 2 years at the school, and (3) are willing to participate in research. Table 1 presents the demographic information of the participants.

Table 1. Participant Demographic Information

Participants	Gender	Age	Education	Experience
Teacher 1 (KS)	L	52 years old	S2	25 years
Teacher 2 (SR)	P	45 years old	S1	18 years old
Teacher 3 (DW)	P	38 years old	S1	12 years
Teacher 4 (AN)	P	35 years old	S1	10 years
Teacher 5 (RH)	L	42 years old	S1	15 years
Teacher 6 (YN)	P	33 years old	S1	8 years
Teacher 7 (FM)	P	29 years old	S1	5 years
Teacher 8 (WD)	L	40 years	S1	14 years
Teacher 9 (LP)	P	31 years old	S1	6 years

Data collection

Data was collected through triangulation techniques that included in-depth interviews, observations, and documentation. Semi-structured interviews were conducted with each participant for 45-60 minutes using validated interview guidelines. Interview questions include an understanding of deep learning concepts, implementation experiences, attitudes toward curriculum changes, and supporting and inhibiting factors. Non-participant observations were made of 4 learning sessions to see the practice of deep learning in the classroom. Documentation includes learning tools, student work, and school policy documents.

Data analysis

Data analysis uses the interactive model Miles, Huberman, and Saldaña (2014) which consists of three components: data condensation, data presentation, and conclusion/verification. Data condensation is carried out through a coding process of interview transcripts and observation notes. Data presentation uses matrices and networks to identify patterns and relationships. Drawing conclusions is done iteratively by verifying findings through triangulation of sources and techniques.

Data validity

The validity of the data is guaranteed through the trustworthiness criteria of Lincoln and Guba (1985): credibility through prolonged engagement, triangulation, and member checking; transferability through thick description; dependability through trail audits; and confirmability through the reflectivity of researchers. Member checking is

carried out by presenting provisional findings to participants to verify the accuracy of interpretation.

RESULTS AND DISCUSSION

Teachers' understanding of deep learning

The results of the interviews showed variations in teachers' understanding of the concept of deep learning. Most teachers (6 out of 9 participants) associated deep learning with active, learner-centered learning. Teacher SR stated:

> "Deep learning is in my opinion deep learning, ma'am, so children not only memorize but really understand. They actively ask questions, discuss, and work on projects."

However, understanding of the mindful learning aspect is still limited. Only 3 participants mentioned the elements of awareness and reflection in learning. The principal (KS) explained:

> "I realized that deep learning has three main components: mindful, meaningful, and joyful. But indeed for this mindful we still need to explore together, because the concept is a bit abstract to be applied in elementary school."

Learning observations conducted during 4 classroom sessions showed that teachers tend to implement meaningful and joyful learning aspects well, such as relating material to daily life and using educational games. In two observed sessions, teachers utilized group discussions and project-based activities that encouraged student collaboration and contextual understanding. However, practices that explicitly develop learning awareness and metacognition were still rarely seen. Only one observed session included reflective activities where students were asked to evaluate their own learning process. Teachers predominantly used direct instruction followed by student activities, with limited scaffolding for self-directed learning.

Documentation analysis of lesson plans (RPP/modul ajar), student worksheets (LKPD), and school policy documents revealed that most teachers had incorporated elements of meaningful and joyful learning into their planning documents. Six out of nine teachers included differentiated learning strategies in their lesson plans. However, explicit references to mindful learning or metacognitive development were found in only two lesson plans. Student work samples showed evidence of project-based and collaborative activities, indicating that meaningful learning was being practiced. School policy documents confirmed that the principal had issued directives supporting the gradual implementation of the Independent Curriculum, including regular teacher discussion forums and lesson study activities.

Teachers' attitudes towards the application of deep learning

In general, teachers' attitudes towards the application of deep learning in the Independent Curriculum are positive. From the cognitive aspect, teachers believe that deep learning can improve the quality of learning. Teacher AN stated:

> "I believe this deep learning is good for children. They will understand better, not just memorize. The value may not be immediately high, but the understanding is more enduring."

From the affective aspect, most teachers felt enthusiastic but also anxious. FM teachers who are classified as young teachers revealed:

> "I am happy with this new curriculum because it is more flexible. But sometimes I also worry, is what I'm doing right? Because there are no very detailed guidelines like the previous curriculum."

The main concerns expressed by teachers were related to administrative burden and preparation time. Teacher DW said:

> "The concept is indeed good, but preparing for really in-depth learning takes extra time and energy. Especially if it's P5, it's quite time-consuming to prepare."

Supporting and inhibiting factors

Data analysis identified several factors supporting the implementation of deep learning at SDN Pajaran 04. First, leadership support from the principal who actively facilitates the professional development of teachers. Second, the availability of adequate facilities and infrastructure, including internet access and learning media. Third, a culture of collaboration between teachers through regular discussion forums and lesson studies. Teacher YN narrates:

> "What really helps is sharing with my teachers. Every week we have discussions, share good practices, if there are difficulties, we can ask directly. The principal was also very supportive."

On the other hand, several inhibiting factors were also identified. First, the limited time to prepare for deep learning in the midst of administrative demands. Second, the diversity of students' abilities makes it difficult to apply differentiated learning optimally. Third, there are still limited examples of good practices and references for the implementation of deep learning for the context of elementary schools in Indonesia. Table 2 summarizes these supporting and inhibiting factors.

Table 2. Supporting and Inhibiting Factors for the Implementation of Deep Learning

Supporting Factors	Inhibiting Factors
Principal support	Limited preparation time
Adequate facilities and infrastructure	Diversity of students' abilities
Culture of collaboration between teachers	Limited examples of good practice
Independent Curriculum Training	Administrative burden
Intrinsic motivation of teachers	Parents' expectations of values

Discussion

Teachers' understanding of the concept of deep learning

The findings of the study show that SDN Pajaran 04 teachers' understanding of the concept of deep learning is still in the development stage. Even though teachers have participated in the Independent Curriculum training, an understanding of the essence of mindful learning has not been fully formed. This is in line with the findings of Hendrikx (2020) which reveals the tension between policy expectations and actual practices of teachers in the implementation of curriculum reform. The complexity of deep learning concepts that include cognitive, affective, and spiritual dimensions takes time and experience to be fully understood.

The variation in teachers' understanding can be explained through the concept of Pedagogical Content Knowledge (PCK) as developed by Depaepe et al. (2023), who argue that teachers' knowledge evolves through the interplay of content understanding, pedagogical strategies, and practical experience. Teachers with longer teaching experience tend to have a richer repertoire of pedagogical strategies, but may require more adaptation to integrate new concepts. In contrast, young teachers are more open to new approaches but may lack the practical experience to implement them effectively. These findings are consistent with Sancar, Atal, and Deryakulu (2021) research on teacher professional development. Furthermore, Shehata et al. (2024) found that the transition to student-centered learning requires sustained professional development that goes beyond one-time training sessions.

Teachers' attitudes toward the application of deep learning

Teachers' positive attitudes towards deep learning as found in this study are important capital for successful implementation. According to the Theory of Planned Behavior (Ajzen, 1991), positive attitudes will affect the intention and ultimately implementation behavior. However, teachers' concerns regarding administrative burden and preparation time need serious attention. Imants and van der Wal (2020) emphasize the importance of teacher agency in curriculum implementation, which can be hampered if teachers feel burdened by administrative demands. Datnow (2020) similarly found that teachers' sense of ownership over reform initiatives is essential for sustained implementation, highlighting that positive attitudes alone are insufficient without adequate structural support.

Supporting and inhibiting factors in the implementation of deep learning

The supporting factors identified in this study, particularly leadership support and a culture of collaboration, are in line with the findings of Admiraal et al. (2021) on the importance of professional learning communities in teacher competency development. SDN Pajaran 04 which is a favorite school with complete facilities has an advantage in this regard. Fullan et al. (2018) argue that deep learning requires a systemic approach involving school leadership, collaborative culture, and adequate pedagogical infrastructure. The inhibiting factors, including limited preparation time and administrative burden, reflect broader challenges in Indonesian educational reform (Rahmadayanti & Hartoyo, 2022). However, keep in mind that this context may not be generalizable to schools with different conditions.

This research provides practical implications for the professional development of teachers in the implementation of the Independent Curriculum. First, training on deep learning needs to emphasize more on the aspect of mindful learning that teachers still do not understand. Second, the provision of examples of good practices and contextual resources for Indonesian primary schools can help teachers translate concepts into practice. Third, reducing the administrative burden will provide space for teachers to develop more meaningful learning.

CONCLUSION

Based on the results of the study, three main conclusions can be drawn in accordance with the research objectives. First, regarding teachers' understanding of the concept of deep learning, the findings show that teachers' understanding still varies. Most teachers understand deep learning as active and learner-centered learning, with the meaningful and joyful learning aspects being better understood than the mindful learning aspect. The limited understanding of mindful learning indicates that teachers have not fully grasped the essence of metacognitive awareness and reflective practice in the learning process.

Second, regarding teachers' attitudes toward the application of deep learning, the findings indicate that teachers' attitudes are generally positive. Teachers believe that deep learning can improve the quality of learning and produce more enduring understanding. However, concerns persist regarding administrative burden and preparation time, particularly for the P5 (Projek Penguatan Profil Pelajar Pancasila) program. The gap between positive attitudes and practical implementation highlights the need for systemic support.

Third, regarding the supporting and inhibiting factors of deep learning implementation, the study identifies several key supporting factors including leadership

support from the principal, the availability of adequate facilities and infrastructure, and a strong culture of collaboration between teachers through regular discussion forums and lesson studies. Conversely, inhibiting factors include limited preparation time amid administrative demands, the diversity of students' abilities that challenges differentiated learning, and limited examples of good practices for the Indonesian primary school context.

The limitation of this study lies in its specific context in favorite schools with relatively ideal conditions. Further research can be conducted in various school contexts to get a more comprehensive picture. In addition, longitudinal research can be conducted to see the development of teachers' understanding and attitudes as implementation experience increases.

The practical implications of this study are the need to strengthen training that focuses more on the mindful learning aspect, provide contextual examples of good practices, and reduce administrative burdens to provide space for teachers to develop deep learning. A complete conceptual understanding and a positive attitude of teachers are the key to the successful implementation of deep learning in the Independent Curriculum.

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