

Teacher Competence in Facilitating Deep Learning: A Qualitative Case Study in Indonesian Elementary Education

Miftakhul Choer¹, Sukirman², Enung Hasanah³

¹ Universitas Ahmad Dahlan, Yogyakarta, Indonesia; 2408046072@webmail.uad.ac.id

² Universitas Ahmad Dahlan, Yogyakarta, Indonesia; sukirman@mp.uad.ac.id

³ Universitas Ahmad Dahlan, Yogyakarta, Indonesia; enung.hasanah@mp.uad.ac.id

ARTICLE INFO

Keywords:

teachers' competence;
deep learning;
elementary school;
pedagogical interventions;
cognitive transformation

Article history:

Received 2026-01-31

Revised 2026-05-11

Accepted 2026-06-17

ABSTRACT

Limited empirical evidence explains how teacher competence facilitates deep learning in Indonesian elementary education. This study examines how pedagogical, professional, social, and personal competencies support meaningful, reflective, and student-centered learning practices. This qualitative case study was conducted at SD Muhammadiyah 1 Ngaglik, Sleman, Indonesia. Six classroom teachers were purposively selected based on their experience in implementing deep learning practices and their willingness to participate. Data were collected over two months through semi-structured in-depth interviews. The interview transcripts were analyzed using Miles and Huberman's interactive model, consisting of data reduction, data display, and conclusion drawing, supported by ATLAS.ti 9. Trustworthiness was strengthened through member checking, peer review, and systematic documentation of the coding process. The findings show that teacher competence functions as an integrated system rather than as separate domains. Pedagogical competence enabled teachers to design contextual learning activities, while professional competence supported the selection of relevant content, strategies, and media. Social and personal competencies fostered supportive classroom interactions, empathy, student confidence, and reflective participation. These competencies were reflected in the use of problem-based learning, project-based learning, discussion, questioning, concrete media, and digital learning tools. The study suggests that deep learning in elementary classrooms is shaped by the interaction between instructional design, socio-emotional support, and reflective teacher facilitation. Strengthening integrated teacher competence is essential for promoting meaningful learning, higher-order thinking, learner autonomy, and character development in elementary education.

This is an open access article under the [CC BY-NC-SA](https://creativecommons.org/licenses/by-nc-sa/4.0/) license.



Corresponding Author:

Miftakhul Choer

Universitas Ahmad Dahlan, Yogyakarta, Indonesia; 2408046072@webmail.uad.ac.id

1. INTRODUCTION

The rapid development of science and technology in the 21st century has transformed the demands placed on education systems worldwide. Schools are expected not only to develop students' academic knowledge but also to foster critical thinking, creativity, collaboration, communication, and problem-solving skills required in modern society (Kocak et al., 2021; Rahmawati et al., 2025). In this context,

elementary education plays a fundamental role in shaping students' cognitive and social development through meaningful learning experiences (Astuti & Triani, 2024). The quality of these experiences largely depends on teachers' capacity to design and facilitate authentic and engaging learning activities (Chapman, S, & Yates, 2023). Consequently, learning approaches that promote conceptual understanding and active student engagement have become increasingly important in contemporary educational practice (Eticha et al., 2026).

One approach widely discussed in recent educational studies is deep learning. Deep learning emphasizes reflective understanding, conceptual integration, and the application of knowledge in authentic contexts rather than rote memorization (Kemendikdasmen, 2025; Prastyo & Santos, 2025). Through this approach, students are encouraged to connect prior knowledge with new experiences, think analytically, and solve contextual problems independently (Polman et al., 2021). Previous studies have shown that reflective and student-centered learning environments can improve students' higher-order thinking skills and learning motivation (Dewi et al., 2025; Lu et al., 2021). Therefore, the successful implementation of deep learning requires teachers who are capable of designing interactive, inquiry-based, and contextual learning processes.

Despite its growing relevance in contemporary education, the implementation of deep learning in elementary schools remains challenging. Many teachers still rely on conventional instructional practices characterized by teacher-centered learning and an excessive focus on curriculum completion (Natasya et al., 2025; Peter J. et al., 2024). Research on the implementation of the Merdeka Curriculum also indicates that many teachers are still adapting to student-centered approaches and have not fully integrated innovative pedagogical practices into classroom instruction (Ndari et al., 2023). In addition, teachers frequently encounter barriers such as limited access to sustainable professional development programs, insufficient instructional resources, and high administrative workloads (Badri et al., 2016; Gusmana & Syamzaimar, 2023). These challenges reduce opportunities for students to engage in reflective and contextual learning activities that support analytical and creative thinking skills.

Recent international studies have emphasized the central role of teacher competence in promoting effective learning practices. Research conducted in several educational contexts demonstrated that pedagogical adaptability, professional expertise, and classroom interaction quality strongly influence students' conceptual understanding and learning engagement (Canuto et al., 2024). Furthermore, recent studies have highlighted that teachers' social and personal competencies contribute significantly to the creation of inclusive, supportive, and collaborative classroom environments that facilitate reflective learning experiences (Wordu & Isiah, 2020). These findings indicate that teacher competence is not limited to instructional knowledge but also involves interpersonal and reflective dimensions that shape effective classroom practices.

Although previous studies have highlighted the importance of teacher competence and deep learning separately, limited attention has been given to their integrated relationship in elementary education contexts. Most studies focus either on the effectiveness of deep learning approaches or on teacher competency development independently (Blömeke et al., 2022). Only limited studies specifically investigate how pedagogical, professional, social, and personal competencies interact holistically to support the implementation of deep learning in elementary schools. In the Indonesian context, comprehensive studies examining the integration of these competencies within elementary classroom practices remain scarce (Daga et al., 2023). Therefore, empirical evidence explaining how pedagogical, professional, social, and personal competencies collectively influence the implementation of deep learning in Indonesian elementary schools remains limited.

The conceptual framework of teacher competence in Indonesia refers to Law No. 14 of 2005 concerning Teachers and Lecturers and the Regulation of the Minister of National Education No. 16 of 2007. Within this framework, teacher competence consists of four interconnected dimensions: pedagogical, professional, social, and personal competencies (Kurnia et al., 2024). Pedagogical competence relates to teachers' ability to design and manage learning effectively, while professional competence concerns mastery of subject matter and instructional strategies (Kunter et al., 2013). Social

competence emphasizes effective communication and collaboration skills, whereas personal competence reflects integrity, maturity, and exemplary character as educators (Lozano-peña et al., 2021). These competencies collectively serve as important foundations for implementing reflective, contextual, and student-centered learning in elementary schools.

Based on the identified background and research gap, this study addresses the following research questions: How do pedagogical, professional, social, and personal competencies support the implementation of deep learning in elementary schools?

This study aims to map the role of teacher competence in supporting the implementation of deep learning in elementary schools. The novelty of this study lies in its integrated and holistic analysis of pedagogical, professional, social, and personal competencies as interconnected determinants of deep learning implementation in Indonesian elementary schools. Unlike previous studies that examine these aspects separately, this research provides a comprehensive analysis of how the four competencies interact in classroom practice to support reflective, student-centered, and contextual learning processes. The findings are expected to contribute theoretically by strengthening scholarly understanding of the relationship between teacher competence and deep learning implementation. Practically, the results may serve as a reference for policymakers, educational institutions, and teacher professional development programs in designing competency enhancement strategies aligned with the demands of 21st-century education.

2. METHODS

This study employed a qualitative research design with a case study approach to provide an in-depth understanding of the role of teacher competence in the implementation of deep learning in elementary schools (Sugiyono, 2020). The research was conducted at SD Muhammadiyah 1 Ngaglik, Sleman, Special Region of Yogyakarta. The school was selected purposively because it has implemented deep learning practices in classroom instruction, enabling the researcher to examine teacher competence within an authentic educational context.

The participants consisted of six classroom teachers who served as key informants. They were selected purposively based on several criteria: (1) actively implementing deep learning practices in classroom instruction, (2) having at least two years of teaching experience, and (3) being willing to participate in the study. The participants consisted of six female teachers with teaching experience ranging from 2 to 9 years. These characteristics were considered relevant for obtaining rich and contextual data regarding the implementation of deep learning in elementary education.

Data were collected through semi-structured in-depth interviews aimed at exploring teachers' understanding, experiences, and practices related to deep learning implementation (Creswell & Poth, 2023). The interviews focused on the role of pedagogical, professional, social, and personal competencies in planning, implementing, and evaluating classroom learning. Semi-structured interviews were chosen to provide flexibility for participants to elaborate on their experiences while maintaining alignment with the research objectives. The interview data consisted of narratives, perspectives, and reflections related to teachers' instructional practices.

Prior to data collection, all participants were informed about the purpose of the study and provided informed consent voluntarily. The researcher ensured the confidentiality and anonymity of participants throughout the research process. Participants were also informed that they could withdraw from the study at any stage without any consequences.

To ensure the trustworthiness of the findings, several strategies were employed. Credibility was enhanced through member checking by confirming interview interpretations with participants. Dependability was maintained through consistent documentation of the research process and coding procedures. Confirmability was strengthened through peer review and reflective discussions during the analysis process to minimize researcher bias.

Data analysis was conducted using Miles and Huberman's interactive analysis model, which consists of data reduction, data display, and conclusion drawing (Miles et al., 2020), assisted by

ATLAS.ti 9 software. The interview transcripts, originally written in Indonesian, were analyzed before the findings were translated into English. The analysis began with line-by-line coding to identify meaningful statements related to teacher competence and deep learning implementation.

Similar codes were subsequently grouped into categories and sub-themes based on conceptual similarities. These sub-themes were then synthesized into broader themes representing the dimensions of teacher competence. The resulting themes were reviewed repeatedly and compared with the interview data to ensure consistency and relevance.

Furthermore, conceptualization was conducted by analyzing relationships among codes, categories, and themes to develop broader conceptual interpretations of teacher competence in supporting deep learning practices. The conceptual model generated from this process was constructed based on recurring patterns identified in the data and supported by relevant theoretical perspectives.

3. FINDINGS AND DISCUSSION

3.1 Findings

Based on the analysis of the interview transcripts, three main themes were identified: (1) competence and professional rationale, (2) pedagogical interventions and actions, and (3) cognitive transformation and impact. These themes illustrate how teacher competence supports the implementation of deep learning in elementary schools.

3.1.1 Competence and Professional Rationale

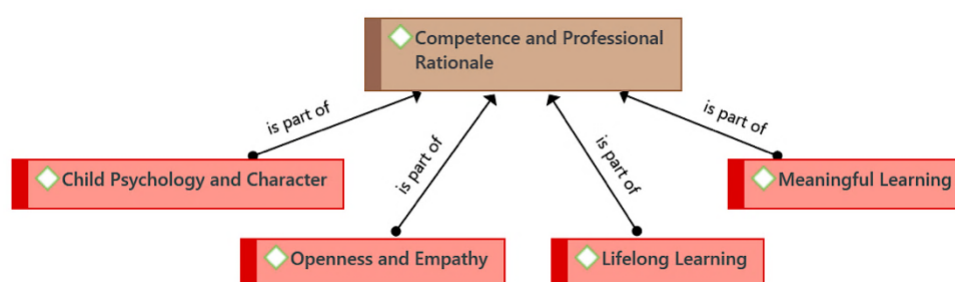


Figure 1. Competence and Professional Rationale

Teacher competence and professional rationale emerged as the foundational factors supporting deep learning implementation. The findings indicate that deep learning is not solely influenced by teachers' technical teaching skills but also by their professional mindset, including understanding students' characteristics, demonstrating empathy, maintaining lifelong learning awareness, and emphasizing meaningful learning.

Teachers' understanding of child psychology enabled them to adjust learning strategies according to students' developmental stages. This understanding helped teachers create contextual and supportive learning experiences. As stated by N2:

"Fourth-grade students are at the concrete operational stage, which makes it easier for them to understand concepts through direct experiences and real-world problem solving." (N2)

This finding suggests that pedagogical competence plays an important role in aligning instructional approaches with students' cognitive development. Rather than merely delivering content, teachers attempted to facilitate conceptual understanding through contextual experiences.

In addition, openness and empathy strengthened classroom interaction and student participation. Teachers encouraged students to express opinions and respect differing perspectives, creating a more inclusive learning environment. One participant explained:

“Encouraging students to express their opinions confidently and to be willing to accept the viewpoints of others.” (N1)

This indicates that social and personal competencies contributed to the creation of collaborative learning environments that support reflective learning processes.

The findings also revealed that teachers viewed lifelong learning as an essential professional value. Teachers recognized the need to continuously improve their knowledge and instructional practices to respond to changing educational demands. As expressed by N3:

“Since we are imperfect individuals, we must become lifelong learners.” (N3)

Similarly, N4 emphasized:

“The value underlying this attitude is lifelong learning, both for teachers and students.” (N4)

These statements demonstrate that professional competence was closely associated with teachers’ reflective awareness and continuous self-development.

Another important finding relates to teachers’ orientation toward meaningful learning. Teachers attempted to connect learning materials with students’ experiences and conceptual understanding rather than focusing only on content delivery. According to N6:

“Students not only receive information but also actively think, create, and reflect on their learning.” (N6)

This finding indicates that teachers positioned deep learning as a process of active knowledge construction, reflection, and conceptual understanding.

3.1.2 Pedagogical Interventions and Actions

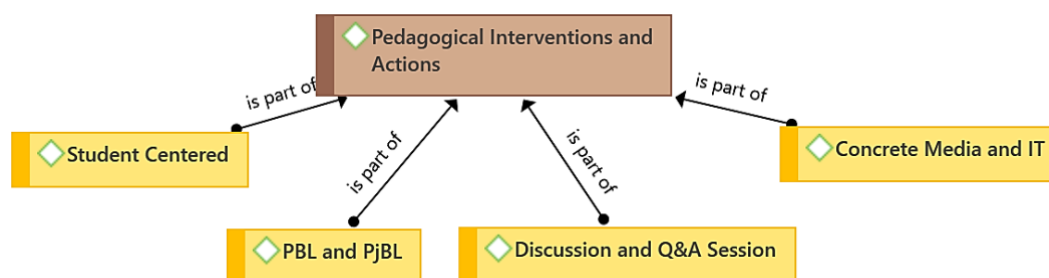


Figure 2. Pedagogical Interventions and Actions

The second theme highlights how teacher competence was translated into concrete pedagogical actions. The findings show that teachers implemented various student-centered strategies to facilitate active participation, critical thinking, collaboration, and contextual understanding.

Student-centered learning became the primary instructional orientation identified in the interviews. Teachers positioned students as active participants who constructed knowledge through interaction and exploration. As stated by N4:

“Students not only receive material from the teacher but also construct their own knowledge through the ongoing learning activities.” (N4)

This approach reflects the application of pedagogical competence in promoting active and reflective learning processes.

The findings further revealed that teachers frequently used Problem-Based Learning (PBL) and Project-Based Learning (PjBL) to encourage higher-order thinking skills. These models enabled students to analyze problems, collaborate with peers, and apply knowledge in authentic situations. N5 explained:

“Students are trained to analyze problems, generate ideas creatively, collaborate, and reflect on both the learning process and outcomes.” (N5)

Rather than focusing solely on task completion, these learning models encouraged students to engage in deeper conceptual exploration and problem-solving activities.

Discussion and question-and-answer methods also emerged as important strategies supporting deep learning. Through peer interaction and classroom discussion, students actively exchanged ideas and clarified concepts collaboratively. According to N1:

“Students begin to identify problems, engage in discussions, and collaboratively seek solutions.” (N1)

This finding demonstrates that classroom interaction functioned not only as communication practice but also as a mechanism for knowledge construction and reflective thinking.

Another significant pedagogical intervention involved the use of concrete and technology-based learning media. Teachers integrated visual, concrete, and digital resources to support students’ conceptual understanding and engagement. As described by N2:

“I use images, short videos, concrete media, interactive slides, and technology-based quizzes.” (N2)

The integration of concrete and digital media indicates teachers’ efforts to make learning more interactive, contextual, and accessible for elementary students.

3.1.3 Cognitive Transformation and Impact

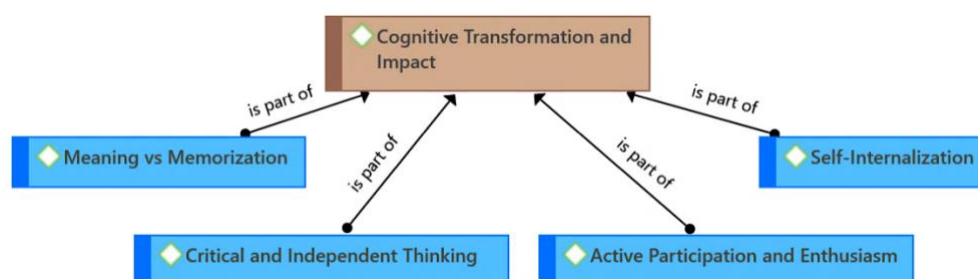


Figure 3. Cognitive Transformation and Impact

The final theme describes the cognitive and behavioral impacts resulting from deep learning implementation. The findings suggest that teacher competence and pedagogical interventions contributed to changes in students’ learning orientation, thinking skills, engagement, and character development.

One major transformation identified was the shift from rote memorization toward conceptual understanding. Students were encouraged to understand relationships among concepts and apply knowledge meaningfully in various situations. N2 explained:

“Students perceive learning as a meaningful experience rather than mere memorization.” (N2)

This finding indicates that deep learning promoted more sustainable and transferable understanding rather than short-term recall.

The implementation of collaborative and reflective learning activities also fostered students’ critical and independent thinking skills. Through discussion and problem-solving activities, students became more responsible for their own learning processes. As stated by N4:

“Students are encouraged to think critically and reflectively while fostering responsibility and collaboration.” (N4)

This suggests that deep learning supported the development of higher-order thinking through active participation and reflective engagement.

Another important impact was the increase in students’ motivation and classroom participation. Teachers observed that students became more enthusiastic when learning activities were connected to meaningful and contextual experiences. N1 stated:

“Students become more active and enthusiastic in the learning process.” (N1)

This demonstrates that meaningful learning environments can positively influence students’ engagement and learning motivation.

Finally, the findings indicate that deep learning contributed to value internalization and character development. Teachers emphasized role modeling and respectful interaction as part of the learning process. According to N5:

“Students feel valued, motivated to learn, and encouraged to develop self-confidence, collaboration, and mutual respect.” (N5)

This finding suggests that deep learning not only affected cognitive achievement but also supported students’ social and personal development through meaningful classroom experiences.

3.2 Discussion

This study indicates that the successful implementation of deep learning at SD Muhammadiyah 1 Ngaglik is not solely determined by curriculum implementation but is strongly influenced by teacher competence as the main driver of the learning process. Teachers function not only as information providers but also as facilitators and learning designers who shape students’ cognitive understanding, reflective thinking, and character development. The relationships among the concepts identified in this study are illustrated in Figure 4.

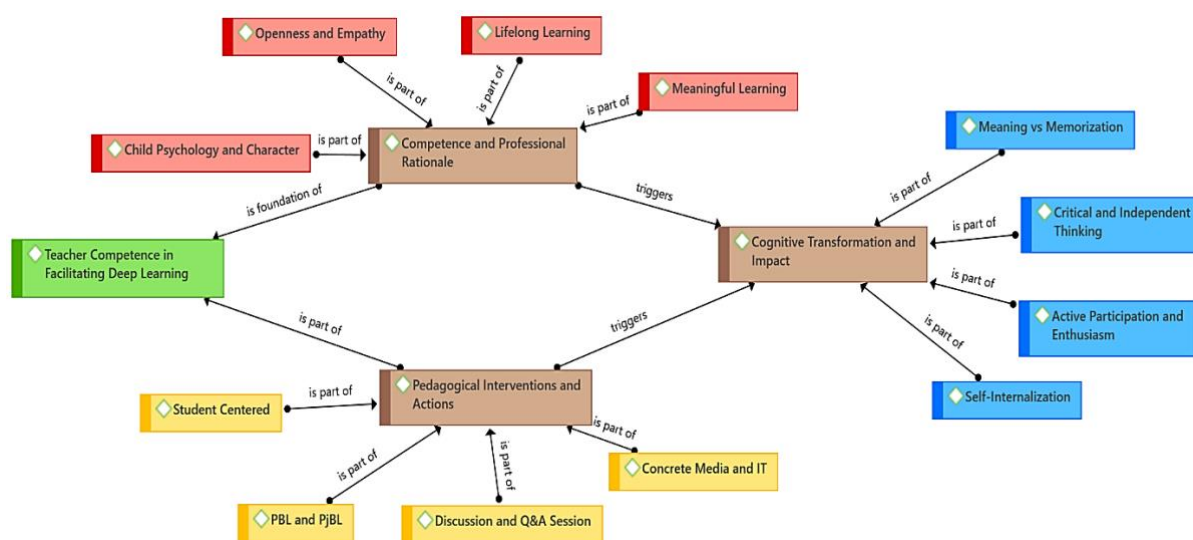


Figure 4. Map of the Teacher Competence in Facilitating Deep Learning

3.2.1 Teachers’ Competence as an Activator of Deep Learning

The results demonstrate that teacher competence plays a central role in activating deep learning in elementary classrooms. Teachers who understand students’ cognitive characteristics are more capable of designing contextual and meaningful learning experiences. This condition reflects constructivist theory, which views learning as an active process in which students construct understanding through experience, interaction, and reflection (Saragih & Nirwana, 2025). In

elementary education, where students are generally at the concrete operational stage, meaningful learning requires authentic experiences and contextual instructional activities.

These findings are consistent with Yuliarsih (2024) and Amelia and Hidayat (2025), who reported that instructional adjustment based on students' developmental readiness improves learning engagement and conceptual understanding. However, the present study extends previous research by demonstrating that deep learning is influenced not only by pedagogical adaptation but also by teachers' socio-emotional competence. Empathy, openness, and supportive classroom interaction were found to strengthen students' confidence and reflective participation during learning activities.

This finding supports socio-constructivist perspectives emphasizing that knowledge is developed through social interaction and collaborative meaning-making. Nevertheless, unlike previous studies that mainly positioned emotional support as a motivational factor, the current findings indicate that socio-emotional competence also functions as a cognitive facilitator that encourages reflective thinking and conceptual exploration. Thus, teacher competence operates not only at the instructional level but also at the interpersonal and psychological levels of learning.

The study further reveals that teachers' awareness of lifelong learning strengthens their instructional flexibility and responsiveness to students' needs. Professional competence, therefore, extends beyond content mastery and includes reflective self-development and continuous adaptation to changing educational contexts. This perspective broadens earlier understandings of professional competence that primarily emphasized technical teaching expertise (Irnanda & Ilmiah, 2025).

3.2.2 Pedagogical Interventions: Implementing Competence into Action

Teacher competence was reflected in various pedagogical interventions designed to facilitate active and meaningful learning. The implementation of Problem-Based Learning (PBL) and Project-Based Learning (PjBL) reflects constructivist principles, where students actively build understanding through inquiry, collaboration, and contextual problem-solving activities.

This interpretation aligns with previous studies reporting that PBL and PjBL promote analytical thinking and conceptual understanding among elementary students (Suryaningsih & Koeswanti, 2021). However, the present findings suggest that the effectiveness of these approaches does not solely depend on the learning model itself. Instead, successful implementation is strongly influenced by teachers' ability to adjust instruction according to students' cognitive readiness, classroom dynamics, and emotional conditions.

From the perspective of Cognitive Load Theory, the use of concrete media functioned as cognitive scaffolding that helped students understand abstract concepts while reducing excessive cognitive burden (Siregar, 2025). Interactive digital media also supported engagement and conceptual visualization. Although previous studies often emphasize technology as a key driver of instructional innovation, the current findings indicate that technology alone does not automatically produce meaningful learning experiences. Digital tools became effective only when integrated with appropriate pedagogical facilitation and reflective classroom interaction.

This result suggests that teacher competence remains a key determining factor in transforming technology from a supplementary tool into a medium that supports conceptual understanding and reflective learning. Furthermore, the integration of concrete, visual, and digital media reflects multimodal learning principles, which emphasize that students develop understanding more effectively when information is processed through multiple sensory channels.

3.2.3 Cognitive Transformation: Outcomes of Effective Teacher Roles

The findings further reveal that teacher competence contributes significantly to students' cognitive transformation, particularly in shifting learning orientation from memorization toward conceptual understanding. This transformation reflects meaningful learning theory, which emphasizes connecting new knowledge with prior experiences and real-life contexts. Students were not only able to recall

information but also demonstrated reflective thinking, conceptual analysis, and contextual application of knowledge.

These findings correspond with UNESCO (2024), which emphasizes that meaningful learning promotes transferable understanding and long-term knowledge retention. However, the present study highlights that such transformation is not automatically generated by learning activities alone. Instead, it emerges through sustained teacher facilitation, reflective interaction, and emotionally supportive classroom environments.

The development of students' critical and independent thinking also reflects the principles of Self-Regulated Learning (SRL). Through collaborative discussions, questioning activities, and reflective tasks, students gradually developed the ability to monitor, evaluate, and manage their own learning processes. Previous studies similarly reported that reflective learning activities support metacognitive development among elementary students (Kristanto & Pradana, 2022). Nevertheless, unlike studies that position learner autonomy primarily as an individual process, the current findings indicate that self-regulated learning among younger learners remains highly dependent on structured teacher guidance and classroom interaction.

Another important outcome concerns students' social and character development. Deep learning not only strengthened conceptual understanding but also promoted responsibility, collaboration, empathy, and mutual respect. This finding supports holistic education perspectives emphasizing the integration of cognitive, social, and emotional dimensions of learning (Rahmawati et al., 2025). However, the present study specifically highlights teacher modeling and interpersonal interaction as central mechanisms shaping character development within deep learning environments.

Overall, the findings demonstrate that deep learning in elementary schools is shaped by the interaction among pedagogical, professional, social, and personal competencies. These competencies operate holistically to influence instructional design, classroom interaction, and students' cognitive transformation. Therefore, deep learning should not merely be understood as a teaching strategy but as a comprehensive educational process supported by reflective and competent teachers.

4. CONCLUSION

This study concludes that the successful implementation of deep learning in elementary schools is strongly influenced by the integration of pedagogical, professional, social, and personal competencies. These competencies collectively support meaningful, reflective, and student-centered learning through the use of contextual strategies such as Problem-Based Learning (PBL), Project-Based Learning (PjBL), collaborative discussion, and concrete as well as digital learning media. The findings indicate that teacher competence contributes not only to students' conceptual understanding and critical thinking skills but also to learning independence, active participation, and character development. Theoretically, this study strengthens constructivist and Self-Regulated Learning (SRL) perspectives by demonstrating that deep learning is shaped through the interaction between instructional practices, socio-emotional support, and reflective teacher facilitation. Practically, the findings highlight the importance of sustainable teacher professional development programs that strengthen reflective, pedagogical, and socio-emotional competencies to support meaningful learning implementation in elementary schools.

However, this study has several limitations. The research involved only six teachers from one elementary school and relied mainly on interview data, limiting the broader transferability of the findings. In addition, the study did not include classroom observations or students' perspectives, which may limit the comprehensiveness of the analysis. Therefore, future studies are recommended to involve multiple schools with diverse educational contexts, integrate classroom observation and student perspectives, and employ mixed-method or longitudinal approaches to obtain a more comprehensive understanding of factors supporting sustainable deep learning implementation in elementary education.

REFERENCES

- Amelia, L., & Hidayat. (2025). Analisis Kesulitan Siswa dalam Menyelesaikan Soal Cerita Materi Perbandingan pada Kelas V SDN 106815 Marindal. *Jurnal Ilmiah Pendidikan Citra Bakti*, 10(2), 227–233.
- Astuti, W., & Triani, L. (2024). Peran Pendidikan Anak Usia Dini Dalam Menunjang Perkembangan Kognitif dan Sosial Anak. *Early Childhood Education and Development Studies (ECEDS)*, 5(2), 36–47. <https://doi.org/10.33846/eceds1101>
- Badri, M., Alnuaimi, A., Mohaidat, J., Yang, G., & Rashedi, A. Al. (2016). Perception of Teachers ' Professional Development Needs , Impacts , and Barriers : The Abu Dhabi Case. *SAGE Open*, 6(3), 1–15. <https://doi.org/10.1177/2158244016662901>
- Blömeke, S., Jentsch, A., Ross, N., Kaiser, G., & König, J. (2022). Opening up the black box: Teacher competence, instructional quality, and students' learning progress. *Learning and Instruction*, 79. <https://doi.org/10.1016/j.learninstruc.2022.101600>
- Canuto, P. P., Choycawen, M., & Pagdawan, R. (2024). The Influence of Teaching, Competencies on Theachers' Performance and Students' Academic Achievement in Primary Science Education. *Problems of Education in The 21st Century*, 82(1), 29–47. <https://doi.org/10.33225/pec/24.82.29>
- Chapman, S, & Yates, C. (2023). I can see the Potential for this in every classroom. *International Journal of Education & the Arts*, 24(19). <https://doi.org/10.26209/ijea24n19>
- Creswell, J. W., & Poth, C. N. (2023). *Qualitative Inquiry and Research Design: Choosing Among Five Approaches (5th ed.)*. Sage Publications.
- Daga, A. T., Wahyudin, D., & Susilana, R. (2023). Students ' Perception of Elementary School Teachers ' Competency : Indonesian Education Sustainability. *MDPI*, 15, 1–18. <https://doi.org/10.3390/su15020919>
- Dewi, L., Rahmawati, M., & Cincin Retna Setiawati. (2025). Kompetensi Pedagogik Guru Sekolah Dasar Dalam Implementasi Kurikulum Merdeka. *Jurnal Pendidikan Dasar Dan Keguruan*, 10(1), 65–78. <https://doi.org/10.47435/jpdk.v10i1.3379>
- Eticha, M. D., Hunde, A. B., & Ketema, T. (2026). The role of a designed problem-solving method with metacognitive scaffolding on students' conceptual change learning and teachers' instructional practices in Biology. *Thinking Skills and Creativity*, 59. <https://doi.org/10.1016/j.tsc.2025.102033>
- Gusmana, I., & Syamzaimar. (2023). Tantangan dan Solusi dalam Peningkatan Kualitas Guru Madrasah Ibtidaiyah di Era Digital. *Al-Mujahadah: Islamic Education Journal*, 1(1), 111–118. <https://ejournal.stai-alkifayahriau.ac.id/index.php/almujahadah>
- Irnanda, Y. S., & Ilmiah, R. (2025). Analisis Profesionalisme Guru dalam Meningkatkan Kualitas Pembelajaran. *Jurnal Studi Guru Dan Pembelajaran*, 8(1), 338–350. <https://doi.org/10.30605/jsgp.8.1.2025.5678>
- Kemendikdasmen. (2025). *Naskah Akademik Pembelajaran Mendalam Menuju Pendidikan Bermutu Untuk Semua*.
- Kocak, O., Coban, M., Aydin, A., & Cakmak, N. (2021). The Mediating Role of Critical Thinking and Cooperativity in The 21st Century Skills of Higher Education Students. *Thinking Skills and Creativity*, 42. <https://doi.org/10.1016/j.tsc.2021.100967>
- Kristanto, A., & Pradana, H. D. (2022). Mengembangkan Kemampuan Self-Regulated Learning Bidang Metakognisi. *Jurnal Pedagogi Dan Pembelajaran*, 5(3), 518–524. <https://doi.org/10.23887/jp2.v5i3.44331>
- Kunter, M., Klusmann, U., Baumert, J., Richter, D., Voss, T., & Hachfeld, A. (2013). Professional competence of teachers: Effects on instructional quality and student development. *Journal of Educational Psychology*, 105(3), 805–820. <https://doi.org/10.1037/a0032583>
- Kurnia, I. R., Barokah, A., Edora, & Syafitri, I. (2024). Analisis Empat Standar Kompetensi Guru di Lingkungan Sekolah Dasar. *JPD: Jurnal Pendidikan Dasar*, 65–74. <https://doi.org/10.21009/JPD.XXX>
- Lozano-peña, G., Fabiola, S., & Yaranay, L. (2021). Teachers ' Social – Emotional Competence : History , Concept , Models , Instruments , and Recommendations for Educational Quality. *MDPI*, 13(21).

- <https://doi.org/10.3390/su132112142>
- Lu, K., Yang, H. H., Shi, Y., & Wang, X. (2021). Examining the key influencing factors on college students' higher-order thinking skills in the smart classroom environment. *International Journal of Educational Technology in Higher Education*, 18(1), 1–13. <https://doi.org/10.1186/s41239-020-00238-7>
- Miles, M. B., Huberman, A. M., & Saldaña, J. (2020). *Qualitative Data Analysis: A Methods Sourcebook (4th ed.)*. Sage Publications.
- Natasya, M., Firdaus, M. I., & Khairani, F. (2025). Kompetensi Pendidik Dan Konvensionalisme Guru: Antara Inovasi Dan Tradisi. *Journal of Sustainable Education*, 2(2), 160–172. <https://doi.org/10.63477/jose.v2i2.182>
- Ndari, W., Suyatno, Sukirman, & Mahmudah, F. N. (2023). Implementation of the Merdeka Curriculum and Its Challenges. *European Journal of Education and Pedagogy*, 4(3), 111–116. <https://doi.org/10.24018/ejedu.2023.4.3.648>
- Peter J., Woods, Y., & Copur-Gencturk. (2024). Examining the role of student-centered versus teacher-centered pedagogical approaches to self-directed learning through teaching. *Teaching and Teacher Education*, 138. <https://doi.org/10.1016/j.tate.2023.104415>
- Polman, J., Hornstra, L., & Volman, M. (2021). The meaning of meaningful learning in mathematics in upper-primary education. *Learning Environments Research*, 24(3), 469–486. <https://doi.org/10.1007/s10984-020-09337-8>
- Prastyo, D. Y., & Santos, M. H. Dos. (2025). Pembelajaran Mendalam sebagai Strategi Transformasi Pendidikan: Studi Persepsi dan Aspirasi Guru Indonesia. *Edu Society: Jurnal Pendidikan, Ilmu Sosial, Dan Pengabdian Kepada Masyarakat*, 5(1), 1073–1085. <https://jurnal.permapendis-sumut.org/index.php/edusociety>
- Rahmawati, Y., Luthfi, N., & Herianingtyas, R. (2025). Pembelajaran Mendalam: Transformasi Pembelajaran Menuju Pendidikan Bermutu. *Jurnal Penelitian Kebijakan Pendidikan*, 18(1), 1–16. <https://doi.org/10.24832/jpkp.v18i1.1281>
- Saragih, M. S., & Nirwana, H. (2025). Tinjauan Sistematis Teori Konstruktivistik : Analisis Prinsip , Implementasi , dan Tantangan dalam Pembelajaran. *Journal of Educational Research and Learning Analytics*, 1(2). <https://doi.org/10.65101/jerlra.v1i2.125>
- Siregar, T. (2025). *Buku Referensi Cognitive Load Theory*. PT Tujuh Pustaka Penerbit.
- Sugiyono. (2020). *Metode Penelitian Pendidikan: Pendekatan Kualitatif, Kuantitatif, dan R&D*. Alfabeta.
- Suryaningsih, A., & Koeswanti, H. (2021). Perbedaan Model Pembelajaran Problem Based Learning dan Project Based Learning Terhadap Peningkatan Kemampuan Berpikir Kritis IPA Siswa SD. *Mimbar PGSD Undiksha*, 9(1), 40–48. <https://doi.org/10.23887/jjpsd.v9i1.33196>
- UNESCO. (2024). *Reimagining our futures together: A new social contract for education*.
- Wordu, H., & Isiah, C. E. (2020). Teachers' competence for effective teaching and learning for the 21st century schools in Nigeria. *International Journal of Applied Research*, 6(1), 235–237.
- Yuliarsih, T., Santosa, S., & Mutiansi, D. (2024). Karakteristik Perkembangan Anak Usia Sekolah Dasar, Pada Fisik-Motorik, Kognitif, Bahasa, dan Implikasinya dalam Pembelajaran. *Jurnal Ilmiah Pendidikan Dasar*, 9(2), 4–6.