



Implementation of Deep Learning Approach Through Meaningful Learning to Improve Critical Thinking Skills of Grade V Students

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Abstract. This research is motivated by the low critical thinking skills of grade V students which are still dominated by memorization-oriented learning. The purpose of this research is to analyze the implementation of *the deep learning* approach through *meaningful learning* in improving students' critical thinking skills. The method used is a literature study by examining various scientific sources in the form of national and international journals and relevant books in the last five years. The data collection technique is carried out through searching, selection, and analysis of documents related to the concepts of *deep learning*, *meaningful learning*, and critical thinking. The results of the study show that the application of *the deep learning* approach combined with *meaningful learning* can encourage active student engagement, improve analytical skills, and help students relate new knowledge to previous experiences. In addition, this strategy has proven to be effective in developing critical thinking skills because it emphasizes deep understanding, reflection, and contextual problem-solving. Thus, this approach can be an innovative alternative in learning in elementary school.

Keywords: deep learning, meaningful learning, critical thinking, literature study, elementary school students.

1. Introduction

According to [1], critical thinking skills are cognitive abilities that include analysis, evaluation, and logical conclusion drawing in dealing with various problems. This skill is one of the main competencies that must be developed in elementary school students, especially in facing the demands of 21st century learning. However, empirical conditions show that the critical thinking skills of grade V students are still relatively low because the learning process tends to be teacher-centered and emphasizes memorization. Ennis [2] stated that learning that does not provide space for exploration

and reflection will hinder students' critical thinking development. In addition, less contextual learning causes students to have difficulty in relating concepts to real life so that understanding becomes shallow and does not last long.

Fullan et al. [3] explained that *the deep learning* approach focuses on deep understanding, active engagement, and the ability to connect knowledge with real-life contexts. This approach is relevant to improve the quality of learning because it not only emphasizes mastery of the material, but also on the development of high-level thinking skills. Hattie [4] also emphasized that effective learning is learning that can encourage students to think deeply through active interaction and reflection. In this context, *the deep learning* approach can be a solution in overcoming students' low critical thinking skills by providing a more meaningful and student-centered learning experience.

Novak [5] states that *meaningful learning* is a learning process that relates new information to the cognitive structure that students already have, resulting in a deeper understanding. This concept emphasizes the importance of relevant and contextual learning experiences for students. Mayer [6] also explained that meaningful learning occurs, students are able to integrate new knowledge with previous knowledge through an active process. The integration between *deep learning* and *meaningful learning* allows students to not only understand concepts theoretically, but also to be able to apply them in real situations. This is an important foundation in the development of critical thinking skills of elementary school students.

Creswell [7] explained that literature study is a systematic research method in reviewing, evaluating, and synthesizing various scientific sources relevant to research topics. This method is used to gain a comprehensive understanding of concepts, theories, and findings of previous research. Snyder [8] added that literature studies allow researchers to identify research gaps and provide a solid foundation for the development of scientific studies. In this study, literature studies are used to analyze the implementation of *deep learning approaches* through *meaningful learning* in improving the critical thinking skills of grade V students based on various reliable sources in the last five years.

Brookhart [9] states that the development of critical thinking skills in learning requires strategies that encourage students to analyze, evaluate, and create solutions to problems. This shows that learning must be systematically designed to be able to foster active student involvement. Paul and Elder [10] also emphasized that critical thinking is not only related to cognitive abilities, but also reflective attitudes and the ability to make rational decisions. Theoretical studies on critical thinking, *deep learning*, and *meaningful learning* are important foundations in this study to provide a conceptual overview and practical implications in improving the quality of learning in elementary schools.

This phenomenon raises concerns for educators and parents regarding the influence of gadgets on student learning activities, which includes aspects of concentration, motivation, and learning effectiveness. Along with the increasing use of gadgets, it is

important for various parties to understand their impact and find ways to use gadgets wisely in the learning process.

2. Research Methods

This research uses a qualitative approach with the type of literature review which aims to examine in depth various scientific sources related to the implementation of *deep learning* through *meaningful learning* in improving the critical thinking skills of grade V students. The data sources in this study are in the form of national and international journal articles, scientific books, and research reports published in the period of 2015–2026. Data collection techniques are carried out through searching databases such as Google Scholar and other scientific sources using keywords that are appropriate to the research topic. The instrument used is a document analysis sheet that functions to identify, group, and evaluate the content of the literature studied. The data analysis technique is carried out through the stages of data reduction, descriptive data presentation, and synthesis extraction to find patterns and relationships between concepts. The validity of the data is maintained through triangulation of sources by comparing various relevant references and ensuring the credibility of the sources used so that the results of the research can be scientifically accounted for.

3. Results And Discussion

In this section, the results of literature reviews that have been conducted on several previous studies relevant to the topic are presented Implementation of the Deep Learning Approach through Meaningful Learning to Improve the Critical Thinking Skills of Grade V Students. This analysis aims to identify the main findings, research methods used, and conclusions obtained from each researcher. Thus, researchers can obtain a comprehensive picture of the implementation of Deep Learning through Meaningful Learning to improve critical thinking skills. The results of the study are then summarized in the form of table 1 to make it easier for readers to understand comparisons between researches and findings. The presentation of data in the form of table 1 is expected to provide systematic, clear, and structured information as a basis for further discussion.

Learning in elementary school basically still faces the main problem in the form of dominance of memorization methods and teacher-centered learning, so that student involvement in the learning process is not optimal. This condition has an impact on students' low ability to think critically because they are not used to analyzing, evaluating, and drawing conclusions independently [11], [12].

To overcome these problems, a learning approach is needed that is able to encourage active student involvement while building deep understanding. The deep learning approach that is integrated with meaningful learning is one of the relevant alternatives because it is able to change the learning process to be more exploratory, reflective, and contextual. Through this approach, students not only receive information, but are also involved in building knowledge based on the real experiences they have [11], [13].

Table 1. Summary of Previous Findings

Researcher	Year	Research title	Method	Main Findings
Panggabean et al [11]	2025	Deep Learning Implementation in Elementary Schools: Enhancing Critical thinking and Meaningful Learning through Contextual Pedagogy	Literature Review	The deep learning approach is able to improve students' critical thinking skills through contextual and meaningful learning.
Prasetyo, D & Mulyani, E [13]	2025	The Urgency of Discovery Learning Model with Meaningful Learning Approach to Enhance Students' Critical Thinking Skills	Literature Review	Meaningful learning helps students understand concepts deeply and improve critical thinking skills in the learning process.
Hasanah, et al [14]	2025	Deep Learning-Based Learning Strategies in Realizing Meaningful, Critical, and Enjoyable Learning	Literature Review	Deep learning strategies create meaningful, critical, and fun learning so that students are more active and reflective.
Supyana G [15]	2025	The Role of Deep Learning in Improving Language and Critical Thinking Competencies of Elementary School Students	Literature Review	Deep learning provides room for analysis, reflection, and problem-solving that has an impact on improving students' critical thinking.
Nafi'ah & Faruq [16]	2025	Conceptualizing Deep Learning Approach in Primary Education: Integrating Mindful, Meaningful, and Joyful	Literature Review	The integration of mindful, meaningful, and joyful learning Increases students' active engagement and strengthens conceptual understanding
Andayanie, Adhantoro, Purnomo, & Kurniaji [17]	2025	Implementation of Deep Learning in Education: Towards Mindful, Meaningful, and Joyful Learning Experiences	Literature Review	Deep learning plays a role in creating a more immersive, meaningful, and enjoyable learning experience for elementary school students.
Gandi Wibowo et al [18]	2025	Implementation of Deep Learning Approach in Improving Students' Understanding of	Qualitative (Case Study)	The implementation of the deep learning approach showed a significant increase in students' concept understanding, which was measured through the

	Concepts in Elementary School	indicators of mindful learning, meaningful learning, and joyful earning
Gede Yuda 2025 Permana [19]	Problem-Based Learning Model with a Deep Learning Approach to Improve the Learning Outcomes of Grade 5 Students of SD Negeri 4 Tukadsumaga	Classroom Action Research The use of Deep Learning technology in PBL is able to help students understand concepts more deeply. In addition, this pattern of improving learning outcomes is in line with previous research showing that the use of artificial intelligence-based technology can increase the effectiveness of student understanding up to 30% higher than conventional methods.

In addition, meaningful learning has been proven to make it easier for students to understand concepts because the material is associated with daily life. This not only improves understanding but also strengthens students' memory and ability to reinterpret concepts that have been learned systematically. Thus, learning is no longer superficial but develops into a deeper understanding [13], [14].

Furthermore, the development of critical thinking skills requires learning activities that involve the process of analysis, reflection, and problem-solving. The *deep learning* approach provides space for students to do this through discussion, exploration, and evaluation of a problem. This activity has been proven to be able to significantly improve students' critical thinking skills because students are trained to think logically and systematically [12], [15]. On the other hand, learning that is designed in a meaningful and fun way also affects student motivation and engagement.

When students feel that learning is relevant to their lives, they tend to be more active in asking questions, discussing, and expressing opinions. This shows that the integration of *deep learning* and *meaningful learning* not only has an impact on the cognitive aspect, but also on the affective and social aspects of students [14], [16].

However, the success of the implementation of this approach is inseparable from the learning strategies used by teachers. Learning designed through approaches such as *project-based learning*, problem-based learning, and learning personalization has proven to be more effective in creating a deep and meaningful learning experience. Therefore, the ability of teachers to design learning is an important factor in optimizing the application of this approach [15], [17].

Overall, it can be understood that learning that integrates *deep learning* and *meaningful learning* is able to provide a more contextual, active, and reflective learning experience. This has implications for increasing students' ability to understand concepts in depth and develop critical thinking skills needed in daily life [11], [14], [15].

4. Conclusion

The conclusions that can be drawn from the results of this study show that the implementation of *the deep learning* approach through *meaningful learning* has a significant contribution to improving the critical thinking skills of grade V elementary school students. Learning that is designed in depth and meaningfully can change students' learning patterns from being passive to more active, reflective, and analytical. Students not only understand the material conceptually but are also able to relate it to real experiences and develop the ability to solve problems logically. In addition, the integration of the two approaches has proven to be effective in creating contextual learning, increasing student involvement, and strengthening high-level thinking skills. These findings also show that the success of the implementation of this approach is greatly influenced by the learning strategies used and the readiness of teachers to manage the learning process in an innovative and student-centered manner.

Authors' Contributions

Rika Rahma Yeni contributed to developing the research concept, writing the background section, and preparing the overall article manuscript. Tazkiya Qusoiyi Nabila contributed to collecting and analyzing literature sources relevant to the research topic. Retna Mega Kartika was responsible for preparing the research methods section and processing data from the literature review. Adinda Natasya contributed to writing the results and discussion section as well as preparing the table of previous research studies.

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References

- [1] P. Facione, "Critical Thinking: What It Is and Why It Counts," *Insight Assessment*, Jan. 2015.
- [2] R. H. Ennis, "Critical Thinking Across the Curriculum: A Vision," *Topoi*, vol. 37, no. 1, pp. 165–184, Mar. 2018, doi: 10.1007/s11245-016-9401-4.
- [3] M. Fullan, J. Quinn, and J. Meechen, "Praise for Deep Learning: Engage the World Change the World," 2017.
- [4] J. Hattie, *Visible Learning for Teachers: Maximizing Impact on Learning*. Routledge, 2020.

- [5] J. D. Novak, *Learning, Creating, and Using Knowledge: Concept Maps as Facilitative Tools in Schools and Corporations (2nd ed.)*. Routledge, 2016.
- [6] R. E. Mayer, *Multimedia Learning (3rd ed.)*. Cambridge University Press, 2020.
- [7] J. W. Creswell, *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches (5th ed.)*. Sage Publications, 2018.
- [8] H. Snyder, “Literature review as a research methodology: An overview and guidelines,” *J. Bus. Res.*, vol. 104, pp. 333–339, 2019, doi: 10.1016/j.jbusres.2019.07.039.
- [9] S. M. Brookhart, *How to Assess Higher-Order Thinking Skills in Your Classroom*. ASCD, 2017.
- [10] R. Paul and L. Elder, *The Miniature Guide to Critical Thinking Concepts and Tools*. Foundation for Critical Thinking, 2019.
- [11] P. Panggabean, A. Zuhdi, and U. Islam Negeri Syekh Ali Hasan Ahmad Addary Padangsisimpuan, “Deep Learning Implementation in Elementary Schools: Enhancing Critical Thinking and Meaningful Learning Through Contextual Pedagogy,” *International Journal of Social Science*, vol. 5, no. 1, pp. 2827–766, 2025, doi: 10.54443/ijset.v5i1.1356.
- [12] Rahmita, “Optimization of critical thinking skills in Indonesian language learning through deep learning in elementary schools,” *Journal of Sultra Elementary School*, vol. 6, no. 3, 2025, doi: 10.64690/jses.v6i3.487.
- [13] D. Prasetyo and E. Mulyani, “The urgency of discovery learning model with meaningful learning approach to enhance students’ critical thinking skills,” *Jurnal Kependidikan*, vol. 9, no. 2, 2025, doi: 10.21831/jk.v9i2.88266.
- [14] R. Hasanah, H. Prayitno, S. Tuti, S. Sarilan, and V. Prakoso, “Deep Learning-Based Learning Strategies in Realizing Meaningful, Critical, and Enjoyable Learning,” *Journal of Deep Learning*, pp. 179–187, Sep. 2025, doi: 10.23917/jdl.v1i2.11572.
- [15] G. Supyana, “The role of deep learning in improving language competence and critical thinking of elementary school students,” *Journal of Sultra Elementary School*, vol. 6, no. 2, 2025, doi: 10.64690/jses.v6i2.481.
- [16] J. Nafi’ah and D. Faruq, “Conceptualizing Deep Learning Approach in Primary Education: Integrating Mindful, Meaningful, and Joyful,” *Journal of Educational Research and Practice*, vol. 3, pp. 225–237, Jul. 2025, doi: 10.70376/jerp.v3i2.384.

- [17] L. Andayanie, M. Adhantoro, E. Purnomo, and G. Kurniaji, "Implementation of Deep Learning in Education: Towards Mindful, Meaningful, and Joyful Learning Experiences," *Journal of Deep Learning*, pp. 47–56, Jun. 2025, doi: 10.23917/jdl.v1i1.11157.
- [18] G. W. Wibowo, D. Gunawan, and D. Mardiana, "Implementation of deep learning approach in improving students' understanding of concepts in elementary school," *Pendas: Scientific Journal of Elementary Education*, vol. 10, no. 3, pp. 144–158, 2025.
- [19] I. G. Y. Permana, I. K. Suparya, and I. M. A. Winangun, "Model Problem-Based Learning dengan Pendekatan Deep Learning untuk Meningkatkan hasil Belajar IPAS Siswa Kelas 5 SD Negeri 4 Tukadsumaga," *Suluh Pendidikan: Journal of Education Sciences*, vol. 23, no. 1, pp. 873–880, 2025.

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