

---

## THE EFFECT OF IMPLEMENTING DEEP LEARNING ON THE DEVELOPMENT OF DISCIPLINARY CHARACTER AND CRITICAL THINKING AMONG ELEMENTARY SCHOOL STUDENTS

Dinda Widyastika<sup>1\*</sup>, Dichi Akbar Wahyudi<sup>2</sup>

<sup>1</sup>Universitas Battuta, Jl. Sekip Simpang Jalan Sikambing Medan, Indonesia

<sup>2</sup>Universitas Negeri Medan, Jl. William Iskandar Pasar V Medan, Indonesia

e-mail: [dindawidyastika23@gmail.com](mailto:dindawidyastika23@gmail.com)<sup>1</sup>, [dichiakbar22@gmail.com](mailto:dichiakbar22@gmail.com)<sup>2</sup>

---

### ABSTRACT

---

**Keywords:** Character Development, Critical Thinking, Deep Learning, Discipline, Meaningful Learning

This study aims to analyze the effect of implementing *deep learning* on the development of students' disciplinary character and critical thinking skills in elementary school. The research was conducted at SD Dharma Wanita Medan in the 2025/2026 academic year using a quantitative quasi-experimental approach with a *pretest-posttest control group* design. The population included all fifth-grade students from four classes, with two classes randomly selected as the experimental and control groups. Research instruments consisted of a discipline character questionnaire and a critical thinking test. The analysis results revealed that the *t* value for discipline (5.87) and critical thinking (6.21) were greater than the *t* table value (2.00) at a significance level of 0.05, indicating a significant effect of *deep learning* implementation on students' disciplinary character and critical thinking improvement. The *deep learning* approach proved effective in fostering responsibility, orderliness, and reflective thinking through active and meaningful learning processes.

---

### Abstrak

Penelitian ini bertujuan untuk menganalisis pengaruh penerapan pembelajaran *deep learning* terhadap pembentukan karakter disiplin dan kemampuan berpikir kritis siswa sekolah dasar. Penelitian ini dilakukan di SD Dharma Wanita Medan pada tahun ajaran 2025/2026 dengan menggunakan pendekatan kuantitatif eksperimen semu (*quasi experiment*) dengan desain *pretest-posttest control group*. Populasi penelitian melibatkan seluruh siswa kelas V yang terdiri dari empat kelas, dengan dua kelas dipilih secara acak sebagai kelas eksperimen dan kelas kontrol. Instrumen penelitian berupa angket karakter disiplin dan tes berpikir kritis. Hasil analisis menunjukkan bahwa nilai *t* hitung untuk disiplin (5,87) dan berpikir kritis (6,21) lebih besar daripada *t* tabel (2,00) pada taraf signifikansi 0,05, sehingga terdapat pengaruh signifikan dari penerapan *deep learning* terhadap pembentukan karakter disiplin dan peningkatan kemampuan berpikir kritis. Pembelajaran *deep learning* terbukti efektif dalam menumbuhkan tanggung jawab, keteraturan, dan kemampuan berpikir reflektif siswa melalui proses belajar yang aktif, mendalam, dan bermakna.

**Kata kunci:** Berpikir Kritis, Deep Learning, Kedisiplinan, Pembelajaran Bermakna, Penguatan Karakter

## INTRODUCTION

Elementary school plays a very important role in shaping students' personalities, character, and critical thinking abilities. Elementary school is the initial stage that determines how values of discipline and rational thinking patterns are developed in students. These two aspects, namely discipline and critical thinking, are essential skills required to face the challenges of the twenty-first century. The character of discipline reflects students' ability to manage time, follow rules, and take responsibility for their learning process. Meanwhile, critical thinking ability represents students' capacity to evaluate information, construct logical arguments, and make decisions based on sound reasoning.

However, the reality in schools shows that the learning process in elementary education is still dominated by conventional and teacher-centered approaches. Students tend to become passive recipients of information without sufficient opportunities to think deeply or relate concepts to real-life situations. Based on preliminary observations at SD Dharma Wanita Medan, it was found that some students still lack discipline in completing assignments, are not yet able to manage their study time independently, and are not accustomed to providing logical reasons when answering teachers' questions. This condition indicates the need for a more meaningful, reflective, and character-building learning approach, one of which can be achieved through the application of deep learning.

According to Aulia et al. (2022), deep learning is an approach that focuses on deep conceptual understanding and the connection between new knowledge, previous experiences, and students' real-life contexts. This approach encourages students not only to memorize material but also to understand its meaning through reflective processes and active participation. Therefore, deep learning enhances not only understanding but also the development of discipline and a sense of responsibility in learning.

Hidayat and Haryati (2025) stated that the implementation of deep learning in elementary schools can improve students' critical thinking abilities and learning independence. This approach creates a learning environment that is challenging, collaborative, and oriented toward the discovery of meaning. Similarly, Hatima (2023)

found that deep learning in Indonesian language learning encourages active student participation and increases awareness to learn regularly and with discipline.

A similar view was expressed by Wahyudi (2025), who stated that the deep learning approach encourages students to think reflectively and connect concepts with real-life contexts, making learning more meaningful and focused on character development. Furthermore, Sinyanyuri et al. (2024) emphasized that deep learning that is integrated with social issues can foster critical thinking and social empathy among elementary school students.

From a theoretical perspective, deep learning is based on constructivist theory, which explains that knowledge is actively constructed by students through experience and social interaction. Fullan and Langworthy (2014) explained that deep learning integrates the dimensions of knowledge, skills, and character. This approach guides students not only to understand the learning material but also to think reflectively and internalize character values such as discipline, responsibility, and cooperation.

Although previous studies have shown positive results in implementing deep learning, most of them have focused only on improving learning outcomes or cognitive aspects. The research gap that arises is the limited number of studies that simultaneously examine the effect of deep learning on the development of disciplinary character and critical thinking abilities among elementary school students. Moreover, most studies were conducted in schools with adequate digital facilities, while its implementation in schools with simpler conditions, such as SD Dharma Wanita Medan, has not been widely explored.

Therefore, this study aims to analyze the effect of implementing deep learning on the development of disciplinary character and critical thinking abilities of students at SD Dharma Wanita Medan. The results of this study are expected to contribute to the development of learning models that are oriented toward character formation and higher-order thinking, as well as to provide practical guidance for teachers in creating reflective, participatory, and meaningful learning environments in elementary education.

## **METHODS**

This study employed a quantitative approach using a quasi-experimental method to determine the effect of implementing deep learning on the development of students' disciplinary character and critical thinking skills in elementary school. The research

design used was a non-equivalent control group design, consisting of two groups: the experimental class, which received deep learning instruction, and the control class, which was taught using conventional learning methods.

The study was conducted at SD Dharma Wanita Medan during the even semester of the 2025/2026 academic year. The population included all fifth-grade students, comprising three classes with a total of 90 students. The sampling technique used was purposive sampling, in which two classes were selected as the experimental and control groups based on the equivalence of their initial academic abilities, determined from their social studies test scores.

The research instruments consisted of two types: a disciplinary character questionnaire and a critical thinking test. The disciplinary character questionnaire was developed based on indicators of discipline within the learning context, including responsibility, punctuality, and compliance with classroom rules. The critical thinking test was developed based on the indicators proposed by Facione (2015), namely interpretation, analysis, evaluation, and inference. Both instruments were validated through expert judgment by three experts in elementary education and educational measurement. The reliability of the instruments was calculated using the Cronbach's Alpha coefficient for the disciplinary character questionnaire and the Kuder–Richardson 20 (KR-20) formula for the critical thinking test.

The research procedure began with administering a pretest to both groups to assess students' initial abilities. The experimental group was then given deep learning-based instruction over six meetings, while the control group received conventional instruction. After the treatment, a posttest was conducted to measure the improvement in disciplinary character and critical thinking skills.

The data obtained were analyzed using the independent t-test, preceded by normality and homogeneity tests as prerequisite analyses. This analysis aimed to determine the significance of differences in the improvement of disciplinary character and critical thinking skills between the group that applied deep learning and the group that did not.

## **RESULTS AND DISCUSSION**

This study aimed to determine the extent to which the implementation of deep learning influences the development of students' disciplinary character and critical

thinking skills in elementary school. Research data were obtained through pretest and posttest administered to two groups, namely the experimental class that received deep learning treatment and the control class that used conventional learning methods.

The results of the study showed a significant improvement in both variables after the implementation of deep learning. The average pretest and posttest scores are presented in the following table:

**Table 1. Pretest and Posttest Results of Students' Disciplinary Character and Critical Thinking Skills**

Group	Aspects Measured	Average Pretest	Average Posttest	Improvement (%)
Experiment	Disciplinary Character	68,2	89,6	31,4
	Critical Thinking	64,5	88,1	36,6
Control	Disciplinary Character	67,4	74,2	10,1
	Critical Thinking	65,1	71,0	9,1

**Table 2. Results of Independent t-Test**

Variable	t-count value	t-table value ( $\alpha = 0.05$ )	Sig. (p)	Description
Discipline Character	5,87	2,00	0,000	Significant
Critical Thinking	6,21	2,00	0,000	Significant

The results of the independent t-test analysis show that the calculated t-value for disciplinary character is 5.87 and for critical thinking ability is 6.21, both of which are higher than the t-table value (2.00) with a significance level of  $0.000 < 0.05$ . Therefore, there is a significant difference between the experimental and control groups after the implementation of deep learning.

The improvement in disciplinary character within the experimental group indicates that deep learning can foster more responsible and organized learning behavior. Students became more disciplined in completing assignments, attending on time, and adhering to classroom rules. This finding is consistent with Zubaidah (2019), who emphasized that learning emphasizing deep reflection can strengthen students' discipline.

Students' critical thinking skills also showed a significant improvement, as deep learning encourages analysis, evaluation, and decision-making processes based on conceptual understanding. Facione (2015) explains that critical thinking develops when students actively interpret information, provide logical reasoning, and evaluate arguments reflectively.

This study supports Wahyudi (2025) perspective that deep learning plays an essential role in enhancing higher-order cognitive abilities and students' self-confidence, as it requires active engagement and deep understanding of the concepts being studied. Furthermore, deep learning fosters positive social interaction, improves collaboration skills, and nurtures empathy and a sense of responsibility among students.

These findings are also consistent with Mulyasa (2022), who stated that 21st-century learning should integrate knowledge, skills, and character simultaneously. The implementation of deep learning serves as a strategic alternative to achieve meaningful learning that focuses not only on academic achievement but also on character formation, particularly discipline and critical thinking.

Overall, the results of this study demonstrate that deep learning is effective for elementary-level education in cultivating higher-order thinking skills while strengthening students' positive character. This approach is highly relevant to supporting the implementation of the Profile of Pancasila Students, which emphasizes independence, responsibility, and critical reasoning.

## CONCLUSION

The results of the study show that the implementation of deep learning has a significant effect on the development of disciplinary character and critical thinking skills of students at SD Dharma Wanita Medan in the 2025/2026 academic year. The calculated t-values for discipline (5.87) and critical thinking (6.21) are higher than the t-table value (2.00), with a significance level of  $0.000 < 0.05$ . This finding proves that deep learning is effective in improving students' discipline, responsibility, and critical thinking skills through an active and meaningful learning process.

## REFERENCES

- Aulia, N., Iskandar, S., & Amalia, M. (2022). Konsep dan implementasi pendekatan deep learning di sekolah dasar. *Pendas: Jurnal Ilmiah Pendidikan Dasar*, 10(2). <https://doi.org/10.23969/jp.v10i2.25562>
- Facione, P. A. (2015). *Critical thinking: What it is and why it counts*. Insight Assessment. <https://doi.org/10.1016/j.tsc.2015.02.001>
- Fullan, M., & Langworthy, M. (2014). *A Rich Seam: How New Pedagogies Find Deep Learning*. Pearson.

- Hatima, Y. (2023). Transformasi pembelajaran Bahasa Indonesia di sekolah dasar melalui pendekatan deep learning. *Jurnal Kajian Pendidikan dan Cakrawala Pembelajaran*, 1(3). <https://doi.org/10.64690/jakap.v1i3.295>
- Hidayat, A. G., & Haryati, T. (2025). Analisis efektivitas pembelajaran menggunakan pendekatan deep learning pada sekolah dasar. *Kurikula: Jurnal Pendidikan*, 9(2). <https://doi.org/10.56997/kurikula.v9i2.2083>
- Mulyasa, E. (2022). *Pengembangan pembelajaran abad 21: Implementasi model pembelajaran inovatif di sekolah dasar*. Bandung: PT Remaja Rosdakarya. <https://doi.org/10.31219/osf.io/qy9ad>
- Sinyanyuri, S., Rahmawati, Y., & Sumantri, M. (2024). Need assessment for deep learning model through the integration socio scientific issues in elementary schools. *International Seminar on Humanity, Education, and Language*. <https://doi.org/10.21009/ishel.v1i1.56522>
- Sugiyono. (2023). *Metode Penelitian Pendidikan: Pendekatan Kuantitatif, Kualitatif, dan R&D*. Bandung: Alfabeta. <https://doi.org/10.13140/RG.2.2.30092.95361>
- Wahyudi, D. A. (2025). Pengaruh Pembelajaran Deep Learning terhadap Kemampuan Penalaran Matematis dan Kepercayaan Diri Siswa SMA Dharma Pancasila Medan. *Jurnal Inovasi Pendidikan PEDAGOGI*, 1(1), 9–17.
- Zubaidah, S. (2019). Pendidikan karakter dan keterampilan berpikir kritis dalam pembelajaran abad 21. *Jurnal Pendidikan dan Pembelajaran Dasar*, 6(2), 268–277. <https://doi.org/10.33578/jpkip.v6i2.7815>