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Deep Learning Approach to Improve Student Learning Outcomes in Social Studies at Elementary School

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ABSTRACT

Social Studies (IPS) learning in fifth graders of Elementary School Lumahlatal is still dominated by a teacher-centered paradigm that impacts low student learning outcomes, so a more active and student-centered alternative approach is needed. This study aims to determine the effectiveness of the implementation of the deep learning approach in improving social studies learning outcomes in fifth graders of Elementary School Lumahlatal. Using a quantitative method with a pre-experimental one-group pretest-posttest design, this study involved 21 students in the even semester of the 2025/2026 academic year as a sample. Data was collected through observation, documentation, and test instruments that had been tested for validity on 15 questions (r_{count} > 0.456) and had very high reliability (Cronbach's Alpha 0.976). Data analysis using the Shapiro-Wilk normality test showed a normal data distribution (sig. > 0.05). The results of the study showed a significant transformation in student learning completion from 28.60% in the pretest to 100% in the posttest, with an average score increasing from 61.35 to 84.5. An N-Gain score of 0.69 confirmed that this approach was effective in the "Moderate" category. This study proves that the integration of joyful, mindful, and meaningful learning components in deep learning can provide a significant positive impact on material mastery compared to conventional methods, while contributing to the transformation of the learning paradigm to a student-centered one.

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1. INTRODUCTION

Education serves as the primary cornerstone for nurturing high-quality, competitive human capital capable of navigating global demands. At the elementary school level, the success of the pedagogical framework depends heavily on the strategic selection of instructional methods and instructional media. Within this foundational tier, social studies occupy a critical strategic position by instilling fundamental social concepts that are pivotal to the development of students' cognitive and affective domains (Ali et al., 2025; Ester et al., 2025). These dual domains provide the essential scaffolding for students to develop social competence, civic awareness, and the core capabilities

required to interact meaningfully within their broader societal environments (Burgos-Videla et al., 2025; Okpomoh et al., 2025).

In the contemporary educational landscape, the optimization of social studies instruction necessitates a robust integration of advanced technology and innovative pedagogical approaches to visualize inherently abstract social paradigms (Kamaruddin & Saqjuddin, 2025). The incorporation of technology is no longer viewed merely as an auxiliary tool but rather as a key catalytic driver essential for engineering inclusive learning environments tailored to 21st-century educational shifts (Jenita et al., 2023). This technological integration ensures that learners transcend superficial rote memorization, empowering them to actively cultivate 4C competencies—comprising creativity, critical thinking, communication, and collaboration—which are indispensable for critically processing and synthesizing generalizations of complex social phenomena (Jamalulail & Rochmiyati, 2023; Hopeman et al., 2022).

Student learning outcomes represent the definitive academic benchmark that reflects the depth of competence and conceptual understanding achieved through structured instructional interventions (Ryan et al., 2022). These educational outcomes systematically encompass three primary domains: cognitive development, affective growth, and psychomotor mastery, all of which are rigorous metrics anchored in institutional curriculum standards (Erawati, 2022). Optimizing these multi-dimensional learning outcomes requires the deliberate architectural design of classroom strategies that stimulate active student engagement, intrinsic motivation, and collaborative participation within a highly meaningful learning ecosystem. Consequently, achieving a seamless alignment between macro-level instructional objectives and micro-level classroom execution remains critical to maximizing student academic achievement.

Despite these critical curricular expectations, empirical observations conducted among fifth-grade students at Elementary School Lumahlatal exposed a substantial gap between theoretical curriculum standards and classroom realities. Students consistently exhibited passive listening behaviors, a profound lack of learning engagement, and acute difficulties in conceptualizing abstract social studies topics, which ultimately culminated in a high rate of failure to satisfy the Learning Objective Achievement Criteria. Diagnostic evaluation indicates that this widespread underperformance stems from the historical dominance of traditional, teacher-centered instructional paradigms and highly monotonous lecture-based methods. This educational stagnation underscores an urgent, undeniable need for systemic pedagogical transformation through innovative approaches that can stimulate deeper conceptual mastery and cognitive engagement.

To address this critical pedagogical gap, this study introduces an innovative framework centered on the application of a deep learning model that simultaneously synthesizes three core dimensions: joyful learning, mindful learning, and meaningful learning (Arif et al., 2025; Feriyanto & Anjariyah, 2024). Diverging sharply from conventional, surface-level teaching methodologies, this integrated paradigm explicitly encourages students to participate in deep reflection and establish cognitive

scaffolds connecting novel knowledge to their prior experiential schema via interactive digital platforms (Khasanah et al., 2025). The fundamental orientation of this deep learning approach shifts the academic focus away from short-term, memory-based outcomes toward transforming systemic learning patterns into collaborative, intellectually rigorous, and holistic cognitive processes (Eren & Küçükdemiral, 2024; Zhao et al., 2022).

Accumulating literature asserts that deep learning mechanisms successfully facilitate interdisciplinary knowledge integration, creative conceptual application, and heightened levels of social engagement by fostering critical and reflective thinking processes (Akmal et al., 2025; Yetti, 2025). By dismantling passive learning habits, this pedagogical model guarantees that students internalize the underlying essence of socio-educational concepts and seamlessly extrapolate them to real-world contexts in a highly functional manner (Fatmawaty, 2024). Given the profound compatibility between deep learning characteristics and the cross-functional 21st-century skillsets demanded by modern social studies curricula (Abidin et al., 2024), there is a compelling academic rationale to examine its structured deployment in primary education.

Grounded in the educational challenges and theoretical potentials, this study aims to empirically evaluate the effectiveness of implementing a deep learning approach to improve Social Studies learning outcomes among fifth-grade students at Elementary School Lumahlatal. By rigorously assessing the shift from teacher-centered passivity to an interactive, deep-learning framework, this research seeks to provide a verifiable, scalable pedagogical alternative for primary school educators. Ultimately, the insights generated from this investigation are expected to contribute significantly to the ongoing discourse on modernizing primary social studies instruction and bridging the persistent gap between curriculum intent and actual classroom achievement in regional educational settings.

2. METHOD

This study used a quantitative method with a pre-experimental approach through a one-group pretest-posttest design to test the effectiveness of the implementation of the deep learning approach on the social studies learning outcomes of fifth-grade students at SD Inpres Lumahlatal. This design was chosen to compare learning outcomes before and after treatment to accurately measure the level of improvement in student competency, with the research design scheme illustrated in Table 1 as follows.

Table 1. One-Group Pretest-Posttest Design

Pretest	Treatment	Posttest
O_1	X	O_2

Where:
O_1 : Pretest (before the application of the deep learning approach)
X : Treatment (application of the deep learning approach)
O_2 : Posttest (after the application of the deep learning approach)

This research was conducted at Elementary School Lumahlatal, West Seram Regency, involving a sample of 21 fifth-grade students in the even semester of the 2025/2026 academic year. The research design included two main variables: the deep learning approach as the independent variable (X) and the fifth-grade students' social studies learning outcomes as the dependent variable (Y). To obtain comprehensive and accurate data, data collection techniques were carried out systematically through observation, administering learning achievement tests, and documenting the entire series of research activities.

The data analysis technique in this study began with a prerequisite test, namely a normality test, to ensure the distribution of the research data. The test was conducted using SPSS 27 software using the Shapiro-Wilk method, which is considered highly effective and accurate for small sample sizes (less than 50 observations) in measuring the degree of agreement between the research data and a normal distribution. Statistical decisions were made based on the 2-tailed significance value (Sig.), where the null hypothesis (H_0) was rejected and the data declared normally distributed (H_1) if the significance value obtained was greater than 0.05.

Next, the effectiveness of the intervention was measured using the Normalized Gain (N-Gain) test to determine the extent to which student learning outcomes improved after implementing the deep learning approach. The N-Gain score represents the difference between pretest and posttest scores, with reference to the ideal mastery target and the established Learning Objective Achievement Criteria. This analysis was conducted manually and supported by SPSS 27 calculations to obtain an objective picture of the treatment's effectiveness in facilitating the transition of student competencies from baseline to achieving the expected learning outcomes. The N-Gain score interpretation criteria are presented in Table 2:

Table 2. N-Gain Score Interpretation Criteria

N-Gain Score	Interpretation
$0.70 \leq g \leq 1.00$	High
$0.30 \leq g < 0.70$	Moderate
$0.00 < g < 0.30$	Low

3. RESULTS AND DISCUSSION

Results

Instrument Validity Test

Validity Test

The pretest and posttest instruments were piloted with 19 students to empirically examine the validity of each item. Validity testing was conducted by computing the correlation between each item and the total score using the Pearson product-moment correlation formula. An item was considered valid if $r_{count} > r_{tabel}$. Based on the data obtained, the r_{table} value was 0.456. The results of the item validity test are presented in Table 3.

Table 3. Item Validity Test Results

Category	Question Number	Number of Grains	Status
Valid	1, 2, 4, 5, 7, 8, 10, 12, 13, 15, 17, 18, 20, 22, 24*	15	Used
Invalid	3, 6, 9, 11, 14, 16, 19, 21, 23, 25*	10	Discarded
Total		25	

The validity test results presented in Table 3, of the total 25 instrument items tested for the pretest and posttest, there were 15 items that were declared valid, while the other 10 items were categorized as invalid. This decision was based on a comparison of the calculated r_value with the r_table value of 0.456, where the invalid items had a correlation coefficient below the threshold and were therefore not used in the research data collection.

Reliability Test

The reliability test was conducted exclusively on the valid items. The Cronbach's Alpha formula was applied, and an instrument was considered reliable if Alpha > 0.60.

Table 4. Reliability Test Results

Cronbach's Alpha	N of Items
0.976	15

The instrument's reliability test results showed Cronbach's Alpha value of 0.976, significantly exceeding the threshold of 0.60, categorizing this research instrument as having very high reliability. This score confirms that the instrument meets consistency and reliability criteria, making it highly suitable for repeated research data collection.

Descriptive Statistics of Pretest and Posttest Learning Outcomes

The following table presents the pretest and posttest learning outcome data collected following the implementation of the deep learning approach in the fifth-grade classroom at Elemetary School Inpres Lumahlatal.

Table 5. Student Learning Outcomes

Evaluation Stage	Number of Students Completed	Number of Incomplete Students	Completion Percentage	Description
Pretest	6	15	28.60%	Not yet reached target
Posttest	21	0	100%	Achieved full completion

As shown in Table 5, the pretest data collected prior to the implementation of the deep learning approach indicate that 15 out of 21 students had not achieved mastery, as their scores fell below the KKTP threshold of 70. Following the implementation of

the deep learning approach, the posttest data reveal that all 21 students demonstrated improvement and achieved mastery.

Descriptive Statistics and Prerequisite Test Results

Descriptive Statistics

The results of the descriptive analysis of pretest and posttest data using SPSS 27 are presented in Table 6.

Table 6. Descriptive Statistics of Student Learning Outcomes

	N	Minimum	Maximum	Mean	Std. Deviation
Preetest	21	49	72	61.35	14.241
Posttest	21	60	100	84.5	14.242
Valid N (listwise)	21				

The descriptive analysis results presented in Table 6, a significant picture was obtained regarding the increase in student learning achievement, where in the pretest stage the lowest score was recorded at 49 and the highest score was 72 with an average score of 61.35. Conversely, in the posttest stage there was a substantial increase in the score threshold with the lowest score being 72, the highest score reaching a perfect score of 100, and the class average achievement increasing to 84.5.

Normality Test

The results of the normality test for the pretest and posttest data using SPSS 27 are presented in Table 7.

Table 7. Normality Test Results of Student Learning Outcomes

	Shapiro-Wilk		
	Statistic	df	Sig.
Pretest	.921	21	.094
Posttest	.936	21	.237

The results of the normality test presented in Table 7 show that the pretest data has a significance value of 0.094 and the posttest data is 0.237. Considering that both significance values are greater than the threshold of 0.05 (sig. > 0.05), it can be concluded that the distribution of data on student learning outcomes variables, both before and after treatment, is normally distributed and meets the criteria for further statistical analysis.

Normalized Gain (N-Gain) Test

The N-Gain test was conducted to assess the degree of improvement in students' learning outcomes before and after the implementation of the deep learning approach. The results are presented in Table 8.

Table 8. N-Gain Test Results of Student Learning Outcomes

	N	Minimum	Maximum	Mean	Std. Deviation
N-gain_Skor	21	.34	1.00	.6974	.19321
N-gain_Persen	21	34.62	100.00	69.7466	19.32131
Valid N (listwise)	21				

The results of the data analysis using SPSS 27, presented in Table 8, yielded an N-Gain value of 0.69. This value falls within the coefficient range of $0.30 \leq g < 0.70$, which statistically classifies the effectiveness of the treatment as "Moderate." These results indicate a consistent and measurable increase in student competency achievement after participating in the learning process using this approach.

Therefore, it can be concluded that the implementation of the deep learning approach has proven effective in improving student learning outcomes in grade V of Elementary School Inpres Lumahlatal with a moderate level of gain. This finding confirms that, despite being in the moderate category, the intervention provided was able to have a significant positive impact on students' mastery of social studies material compared to the initial conditions before the treatment.

Discussion

This study aimed to examine the empirical effectiveness of implementing a deep learning approach in enhancing students' Social Studies (IPS) learning outcomes among fifth-grade learners at Elementary School Lumahlatal. Based on quantitative data analysis, the findings demonstrate that the deployment of this innovative instructional framework significantly improved academic performance, as evidenced by a substantial increase in the mean score from 61.35 on the pretest to 84.5 on the posttest. Furthermore, this intervention catalyzed a profound shift in mastery attainment, escalating from only 6 students initially to all 21 students achieving full curricular competency following the pedagogical treatment. The subsequent sections contextualize these statistical advancements within established theoretical frameworks and contemporary empirical literature, highlighting the academic implications of these transformations.

Analysis of Learning Outcome Improvements and Empirical Alignment

The pronounced escalation in student academic performance corroborates the premise that structured deep learning interventions can systematically optimize primary school Social Studies instruction. This observed improvement strongly aligns with the empirical evidence presented by Julianah et al. (2025), revealing a parallel advancement in learning outcomes within the deep learning experimental cohort. Much like the findings of Afifatun (2025), which highlighted an increase in active student engagement during discussions and critical reflection, the present study observed heightened behavioral and cognitive participation throughout the implementation phase. This consensus indicates that deep learning models effectively

dismantle passive habits, stimulating sustainable cognitive advancement across diverse institutional landscapes.

Interpretation of N-Gain Indicators and Curricular Category

To further quantify the efficacy of this pedagogical paradigm shift, the calculation of the Normalized Gain (N-Gain) score yielded a value of 0.69, which falls within the moderate growth category. This specific finding resonates with the research of Luthfiyah et al. (2025), who demonstrated that deep learning strategies significantly enhance the instructional quality of natural and social sciences (IPAS) in primary education, often resulting in moderate N-Gain indicators that reflect meaningful conceptual evolution. Similarly, Chosya and Takiddin (2025) reported comparable moderate N-Gain ranges (0.32–0.55) when applying deep learning-based worksheets to reinforce Higher-Order Thinking Skills (HOTS) in Social Studies. Within a single-group pretest-posttest matrix at the elementary tier, a moderate gain does not signify instructional limitation; instead, it illustrates an optimized conceptual trajectory that holds potential for further maximization given extended intervention durations and enhanced digital infrastructure.

Paradigm Shift and Educational Transformation in Remote Areas

Prior to the introduction of the deep learning framework, the instructional ecology at Elementary School Lumahlatal was strictly bound by conventional, teacher-centered, and lecture-heavy modalities that rendered young learners' passive recipients of text-based information. As Ambarita et al. (2025) emphasize in their critical critique of pedagogical transformation in Indonesia, conventional methodologies focused heavily on rote memorization and high-stakes standardized testing continue to dominate the national educational landscape. Stasolla et al. (2025) argue that the deep learning model offers a necessary transformative pathway, moving student trajectories from superficial memorization toward holistic comprehension and practical knowledge application. The empirical outcomes of this study validate this theoretical claim, confirming that such radical pedagogical shifts are entirely feasible even within geographically isolated or under-resourced learning environments.

Behavioral Shifts and Bidirectional Classroom Inquiry

This macro-level pedagogical transition directly triggered observable modifications in classroom dynamics and student communication styles. This behavioral evolution corroborates the findings of Asmi and Wijayanto (2025), who explored the combined influence of deep learning and Canva-based interactive media on mathematics learning outcomes, concluding that this framework facilitates a genuine transition from unidirectional information transmission to bidirectional collaborative inquiry. Throughout the intervention at Elementary School Lumahlatal, fifth-grade students shifted from a state of academic reticence to one characterized by proactive questioning, peer-to-peer discourse, and autonomous schema construction. This shift

underscores how modern learning approaches empower students to translate abstract social phenomena into highly relatable, structurally organized cognitive maps.

Synergistic Effects of Joyful, Mindful, and Meaningful Pillars

The empirical success documented in this investigation is fundamentally rooted in the synergistic operation of the three pillars of the deep learning model: joyful learning, mindful learning, and meaningful learning. Syafi'i and Darnaningsih (2025) affirm that these three instructional dimensions are profoundly interconnected and mutually reinforcing: mindful learning fosters acute situational awareness within the cognitive process, meaningful learning anchors abstract content to tangible real-world experiences, and joyful learning establishes a psychologically secure and motivating climate that sustains student persistence. The integration of these three interconnected pillars at Elementary School Lumahlatal successfully neutralized the structural barriers of low student motivation and conceptual fragmentation that had historically hindered primary social studies education.

Comprehensive Domain Integration and HOTS/21st-Century Competencies

The holistic integration of these three domains is further supported by Huda and Hidayatullah (2025), whose empirical findings confirm that the thorough merging of mindful, meaningful, and joyful strategies optimize overarching educational outputs by simultaneously reinforcing the cognitive, affective, and psychomotor foundations of the learner. This multi-dimensional synergy explains the perfect mastery rate achieved by the 21 participants in this study. The deep learning treatment did not merely target isolated cognitive mastery of social science content; it simultaneously nurtured positive academic dispositions and refined critical analytical capabilities. Consequently, this intervention fostered the development of Higher-Order Thinking Skills (HOTS) and 21st-century competencies, which are central to modern educational mandates as highlighted by Hafidzni et al. (2025) and Zebua (2025), who note that deep learning drives critical, creative, and collaborative internalization aligned with Indonesia's Emas 2045 vision. This process was critically dependent on the teacher's capability to pivot from a content-deliverer to an adaptive facilitator, as emphasized by Atmojo et al. (2025) and Suwandi et al. (2024), who assert that teacher pedagogical competence directly dictates the successful implementation of holistic, character-driven deep learning models.

Methodological Limitations, Recommendations, and Institutional Implications

Despite these promising outcomes, several inherent methodological limitations must be acknowledged to guide future scholarly inquiries. The reliance on a one-group pretest-posttest design absent a randomized control group restricts the capacity to isolate confounding external variables or establish definitive causal mechanisms, while the sample size of 21 students limits the immediate generalizability of the findings to broader regional demographics. However, this design was pragmatically dictated by field constraints, as only a single fifth-grade section was accessible at the target

institution. To address these parameters, Kholisah et al. (2025) recommend that subsequent evaluations employ rigorous quasi-experimental designs utilizing distinct control groups within underserved or geographically isolated (3T) regions to expand generalizability. Nevertheless, this study provides compelling empirical validation that deep learning offers an actionable framework to solve persistent performance deficits in primary social education, directly advancing the Ministry of Primary and Secondary Education's mandate to establish mindful, meaningful, and joyful learning as the bedrock of national educational reform.

4. CONCLUSION

The implementation of the deep learning approach has been proven to be significantly effective in improving the learning outcomes of Social Sciences (IPS) in fifth-grade students at Elementary School Lumahlatal, supported by a research instrument with adequate validity on 15 questions ($r_{count} > 0.456$) and very high reliability (Cronbach's Alpha 0.976). The success of this intervention is evident from the transformation of student learning completeness which has increased drastically from 28.60% in the pretest stage to 100% in the posttest, with a substantial increase in the class average score from 61.35 to 84.5. Supported by normal data distribution (sig. > 0.05), the results of the Normalized Gain (N-Gain) test of 0.69 confirm the effectiveness of this approach in the "Medium" category, which confirms that the deep learning strategy can provide a greater positive impact on student mastery of the material compared to previous learning methods.

As a suggestion, it is recommended for educators, especially fifth-grade teachers at Elementary School Lumahlatal, to begin integrating joyful, mindful, and meaningful learning components into social studies learning to create a more interactive and student-centered classroom atmosphere. The school should provide support in the provision of technological facilities and innovative pedagogical training for teachers so that the implementation of the deep learning approach can be carried out consistently to maintain the learning mastery that has been achieved. In addition, for future researchers, it is recommended to expand this study with a wider sample coverage or apply a similar approach to other subjects to test the consistency of the effectiveness of deep learning in improving the quality of basic education.

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