DEEP LEARNING FOR INTEGRATING THE PANCASILA STUDENT PROFILE IN ELEMENTARY EDUCATION

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ABSTRACT
This study examined whether a Deep Learning pedagogical approach could improve Pancasila Education achievement and support development of the Pancasila Student Profile among Grade IV pupils. A quantitative quasi-experimental nonequivalent control group design was used with 40 pupils from two intact classes at SD Inpres 2 Piru: 20 in the experimental group and 20 in the control group. Achievement was assessed through multiple-choice pre-tests and post-tests, while profile-related change was summarized from pre-test/post-test questionnaire scores. The experimental group increased from M = 69.50 (SD = 8.414) to M = 85.50 (SD = 6.262), whereas the control group increased from M = 67.25 (SD = 8.807) to M = 76.00 (SD = 7.363). The post-test group difference was significant, $t(38) = 4.396$, $p < .001$, Cohen's $d = 1.39$. The experimental group also obtained an overall Pancasila Student Profile N-Gain of 0.6134, a medium gain under the conventional normalized-gain criterion. The findings indicate a strong achievement advantage in this study context and moderate within-group improvement in profile scores. Because the profile outcome was not reported as a between-group comparison, causal interpretation of profile development remains limited.

Keywords: Deep Learning, Elementary Education, Pancasila Education, Pancasila Student Profile, Quasi-Experimental

INTRODUCTION

Education in Indonesia is expected to develop knowledge, civic responsibility, and character in ways that are consistent with Pancasila. In school settings, these values are not transmitted only through subject content; they are also developed through teacher-student interaction, classroom routines, collaborative activity, and the wider culture of the school. This orientation is consistent with international scholarship that treats citizenship and character education as overlapping processes involving knowledge, moral judgment, dispositions, participation, and responsible action rather than as the memorization of civic concepts alone (Althof & Berkowitz, 2006; Lickona, 1996). Indonesian studies similarly emphasize contextual learning, school culture, and active participation in strengthening the Pancasila Student Profile (Ardiawan & Adnyana, 2024; Mulyani et al., 2023; Salamor & Patra Ritiauw, 2023; Wahidah et al., 2023).

The Pancasila Student Profile is commonly expressed through six dimensions: faith and piety toward God Almighty and noble character, global diversity, mutual cooperation, independence, critical reasoning, and creativity. These dimensions require learning experiences that integrate cognitive understanding with social, emotional, and behavioral participation. International reviews of citizenship and moral education indicate that dialogic classroom climates, problem-based learning, participatory pedagogy, and structured opportunities for interaction can contribute to civic and moral development (Arellano et al., 2026; Geboers et al., 2013; Schuitema et al., 2008). More broadly, school-based interventions that intentionally develop social and emotional competencies can also support academic and developmental outcomes, particularly when implementation is systematic and well supported (Darling-Hammond et al., 2020; Durlak et al., 2011; Taylor et al., 2017). This evidence reinforces the need to examine approaches that do not separate academic learning from character-related development.

In this article, Deep Learning refers to a pedagogical approach rather than the computational meaning of deep learning in artificial intelligence. The approach emphasizes deep conceptual understanding and is organized around mindful, meaningful, and joyful

learning (Azzahra & Jaya, 2025; Baharuddin, 2025). Conceptually, these principles are compatible with constructivist learning environments in which pupils actively reorganize prior understanding through experience, interaction, and reflection (Loyens & Gijbels, 2008). They are also compatible with the ICAP framework, which predicts stronger learning when students move from passive reception toward active, constructive, and interactive engagement with ideas (Chi & Wylie, 2014). The three principles therefore provide a pedagogical rationale for designing Pancasila Education lessons in which pupils interpret situations, explain reasoning, discuss alternatives, and reflect on the consequences of choices.

Each Deep Learning principle can be related to a well-established strand of international learning research. Mindful learning requires awareness of what is understood, what remains uncertain, and how learning is being regulated; this aligns with self-regulated learning, which integrates metacognitive, motivational, behavioral, and affective processes (Panadero, 2017). Meaningful learning requires pupils to connect new concepts with prior knowledge and authentic problems, a logic consistent with facilitated problem-based learning and knowledge construction (Hmelo-Silver, 2004). Joyful learning is not merely entertainment; it refers to a positive, supportive learning climate that sustains participation, curiosity, and willingness to contribute. Research on student engagement and self-determination suggests that learning environments supporting autonomy, competence, relatedness, and multidimensional engagement can strengthen motivation and participation (Fredricks et al., 2004; Ryan & Deci, 2020).

International evidence also provides a broader rationale for expecting active pedagogies to influence achievement. Reviews of active learning have reported advantages over exclusively transmissive instruction, although effects vary by implementation and context (Prince, 2004). A large meta-analysis in undergraduate STEM education likewise found higher examination performance under active learning than under traditional lecturing (Freeman et al., 2014). These studies do not test the Indonesian Deep Learning framework or elementary Pancasila Education directly, but they support the underlying proposition that cognitively active and interactive learning can improve understanding. Related research on deep and meaningful learning in technology-rich environments emphasizes active engagement, contextualization, and interaction as mechanisms supporting durable learning, while also demonstrating the importance of distinguishing shared mechanisms from context-specific instructional models (Mystakidis et al., 2021).

Recent Indonesian scholarship has begun to connect Deep Learning with the Pancasila Student Profile. Nurlailah and Julkifli (2025) discuss Deep Learning strategies in relation to critical reasoning, while Sari and Supriyadi (2025) emphasize critical and creative reasoning through Deep Learning-based differentiated instruction. A systematic review by Ambrosius Tode Peya Nia Do et al. (2025) also identifies potential links between Deep Learning practices and Pancasila Student Profile development. However, much of this emerging literature is conceptual, descriptive, or implementation oriented. Empirical evidence comparing Deep Learning with a control condition while simultaneously examining academic achievement and profile-related outcomes remains limited.

This gap is important because instructional innovation should be evaluated with evidence that distinguishes subject achievement from character- or profile-related change. The present study therefore contributes context-specific quasi-experimental evidence from Grade IV Pancasila Education. Its novelty lies not in proposing Deep Learning as an entirely new pedagogical concept, but in examining two outcome domains within the same school-based intervention: Pancasila Education achievement and change in Pancasila Student Profile questionnaire scores. The study addresses two questions: (1) whether pupils taught through the Deep Learning approach demonstrate higher post-test achievement than pupils receiving

conventional learning; and (2) to what extent Pancasila Student Profile questionnaire scores improve within the experimental group after the intervention. These questions define the evidentiary boundaries used in the Results, Discussion, and Conclusion.

METHOD

This study used a quantitative quasi-experimental nonequivalent control group design. The study was conducted for one month in West Seram Regency at SD Inpres 2 Piru. The population comprised Grade IV pupils, and the reported sample consisted of 40 pupils selected purposively from two intact classes. Class IVA served as the experimental group (n = 20) and received the Deep Learning approach, whereas Class IVB served as the control group (n = 20) and followed conventional learning. Because intact classes rather than individually randomized pupils were used, the design is quasi-experimental and pre-existing class-level differences remain a possible alternative explanation that should be considered when interpreting causal claims.

The intervention was implemented over the one-month study period and was described as applying mindful, meaningful, and joyful learning. The supplied manuscript does not report the exact number and duration of lessons, teacher assignment, lesson-by-lesson activity sequence, implementation-fidelity indicators, or a detailed operational description of conventional learning in the control class. These details are important for reproducibility and should be added by the authors from the original study records before final publication; no unreported intervention procedures are inferred in this revision.

Data collection used a multiple-choice achievement test, an initial and final questionnaire administered as pre-test and post-test measures, and supporting documentation such as activity photographs and school data. The achievement test assessed Pancasila Education learning outcomes, whereas the questionnaire examined change in the Pancasila Student Profile. The source manuscript states that validity and reliability testing was conducted before the main analysis, but it does not report item counts, scoring ranges, item-to-dimension mapping, validity coefficients, reliability coefficients, or the instrument development/adaptation procedure. Consequently, no psychometric values are reconstructed here; the final author version should report the actual instrument specifications and coefficients from the original analysis.

The analysis proceeded in stages. Descriptive statistics summarized pre-test and post-test achievement scores. The manuscript reports Shapiro-Wilk normality testing and Levene's homogeneity test as assumption checks, followed by an independent-samples t-test of post-test achievement scores at alpha = .05. The experimental-group Pancasila Student Profile questionnaire was summarized using normalized gain (N-Gain). To improve statistical interpretation, the revision reports the t statistic, degrees of freedom, 95% confidence interval, and Cohen's d based on the reported means, standard deviations, and sample sizes. Reporting standardized effect sizes alongside p values is recommended because it communicates the magnitude of observed differences and supports cumulative interpretation across studies (Lakens, 2013). In pre-test/post-test controlled designs, analytical choices regarding baseline and follow-up measurements should be specified in advance and interpreted carefully (Vickers & Altman, 2001); accordingly, the baseline comparison reported below is treated as a supplementary descriptive check rather than a substitute for a prespecified adjusted model.

The source manuscript states that Shapiro-Wilk and Levene tests were conducted but does not provide their numerical statistics or p values. Those values should be inserted from the original statistical output if available. For N-Gain interpretation, the present revision uses the conventional normalized-gain bands associated with Hake (1998): values below 0.30 are low, 0.30-0.70 are medium, and above 0.70 are high. Because those bands originated in physics education, their use for a Pancasila Student Profile questionnaire should be understood as a descriptive convention rather than as a validated profile-specific psychometric standard.

The supplied manuscript does not report an ethics approval identifier, school authorization details, parental or guardian consent, child assent, confidentiality procedures, or data-protection arrangements. Because the participants were elementary-school pupils, these procedures should be reported from the records of the study actually conducted before final publication. No ethics approval, consent procedure, or data-governance practice that was not documented in the source manuscript is assumed in this revision. Figure 1 summarizes the research procedure and the analyses reported in the study.

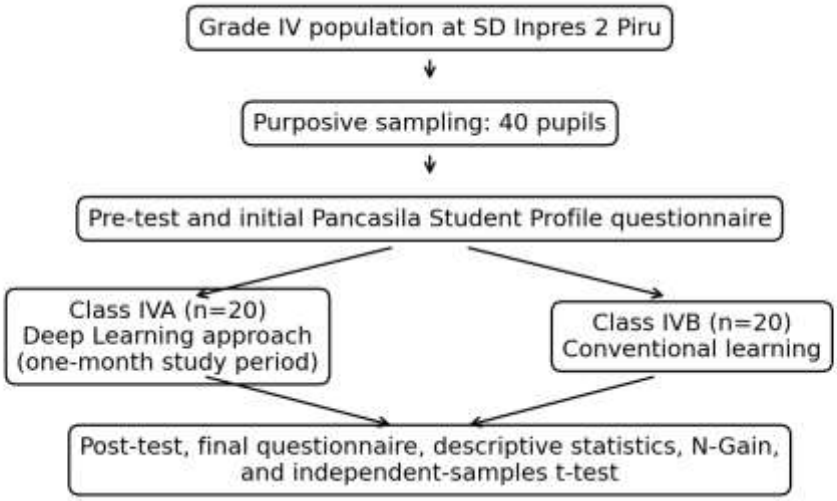

Figure 1. Quasi-Experimental Procedure Reported in the Study

RESULTS AND DISCUSSION

Learning Outcomes

The two groups improved between pre-test and post-test, but the unadjusted change was larger in the experimental class. As shown in Table 1, the experimental group increased from M = 69.50 (SD = 8.414) to M = 85.50 (SD = 6.262), a mean increase of 16.00 points. The control group increased from M = 67.25 (SD = 8.807) to M = 76.00 (SD = 7.363), a mean increase of 8.75 points. The corrected experimental pre-test mean of 69.50 is used consistently in this revision because the value of 68.50 in the original conclusion was inconsistent with the descriptive table.

Table 1. Descriptive Statistics for Pre-test and Post-test Achievement Scores

Measure	N	Range	Min	Max	Mean	SD
Experimental pre-test	20	35.00	50	85	69.50	8.414
Experimental post-test	20	20.00	75	95	85.50	6.262
Control pre-test	20	30.00	50	80	67.25	8.807
Control post-test	20	25.00	60	85	76.00	7.363

A supplementary comparison calculated from the reported pre-test summary statistics indicated no statistically significant difference between the two class means at baseline, $t(38) = 0.826$, $p = .414$. This calculation is reported only as a descriptive check because the original analysis plan did not include a baseline-adjusted model. For the principal post-test comparison, the control group had M = 76.00 (SD = 7.363) and the experimental group had M = 85.50 (SD = 6.262). Re-expressing the software output as experimental minus control, the mean difference was 9.50 points, $t(38) = 4.396$, $p < .001$, 95% CI [5.125, 13.875]. The corresponding Cohen's d

calculated from the pooled standard deviation was 1.39, indicating a large standardized difference in this sample. The appropriate hypothesis decision is therefore to reject H0 for the post-test achievement comparison.

Table 2. Post-test Group Statistics

Group	N	Mean	SD	SE Mean
Experimental	20	85.50	6.262	1.400
Control	20	76.00	7.363	1.646

Table 3. Independent-Samples t-Test for Post-test Achievement

Comparison	Mean diff.	t	df	p	95% CI	d
Experimental - Control	9.50	4.396	38	<.001	[5.125, 13.875]	1.39

These results indicate that the Deep Learning class achieved higher Pancasila Education post-test scores than the control class during the study period. The finding is consistent with international evidence showing that learning tends to improve when students are cognitively active rather than primarily passive recipients of information (Chi & Wylie, 2014; Prince, 2004). Freeman et al. (2014) similarly reported an overall advantage of active learning in a large meta-analysis, although that evidence came from undergraduate STEM settings and should not be treated as a direct estimate for Grade IV Pancasila Education. The current result is therefore best interpreted as context-specific evidence that a pedagogical sequence emphasizing active reflection, contextual meaning, and structured participation can support achievement. Problem-based and constructivist scholarship also suggests that authentic problems, collaborative reasoning, and facilitated knowledge construction can promote flexible understanding when implementation is carefully scaffolded (Hmelo-Silver, 2004; Loyens & Gijbels, 2008). At the same time, the nonrandomized class design means that teacher, classroom, or other pre-existing group factors cannot be completely excluded.

Pancasila Student Profile Outcomes

The second outcome domain concerns change in the Pancasila Student Profile questionnaire within the experimental group. The overall N-Gain mean was 0.6134 (SD = 0.24832), with observed values ranging from -0.18 to 1.00 and a corresponding mean percentage of 61.3387. Under the conventional Hake (1998) normalized-gain bands, 0.6134 falls in the medium range. This classification is used descriptively because the Hake criterion was developed for conceptual learning measures rather than for Pancasila Student Profile questionnaires. More importantly, the supplied results do not provide an equivalent control-group questionnaire comparison. The profile evidence should therefore be interpreted as within-group improvement, not as definitive proof that the intervention caused superior profile development relative to conventional instruction.

Table 4. Overall N-Gain for the Experimental-Group Pancasila Student Profile Questionnaire

Statistic	N	Min	Max	Mean	SD
N-Gain score	20	-0.18	1.00	0.6134	0.24832
N-Gain percentage	20	-18.18	100.00	61.3387	24.83173

At the dimension level, all six reported N-Gain means fell between 0.4676 and 0.6546. Dimension 3 showed the highest value (0.6546), followed by Dimension 5 (0.6167) and

Dimension 2 (0.5882), while Dimension 6 showed the lowest value (0.4676). The source manuscript did not provide the questionnaire item-to-dimension mapping required to verify which named Pancasila Student Profile dimension corresponds to each numbered result. For that reason, Table 5 retains the original dimension numbers rather than assigning unverified labels. The mapping should be inserted from the actual questionnaire before final publication.

Table 5. Dimension-Level N-Gain in the Experimental Group

Reported dimension	N	N-Gain	SD
Dimension 1	20	0.5509	0.65501
Dimension 2	20	0.5882	0.44534
Dimension 3	20	0.6546	0.46262
Dimension 4	20	0.5475	0.40531
Dimension 5	20	0.6167	0.30992
Dimension 6	20	0.4676	0.35371

The dimension-level pattern suggests that profile-related change was not uniform across outcomes. Dimension 3 showed the largest reported gain and Dimension 6 the smallest. Interpretation of that pattern should remain provisional until the questionnaire mapping is verified. Nevertheless, the general direction of improvement is compatible with scholarship emphasizing that citizenship and character outcomes are strengthened through participation, dialogue, contextual problem solving, and repeated opportunities to practice dispositions rather than through declarative instruction alone (Althof & Berkowitz, 2006; Geboers et al., 2013; Schuitema et al., 2008). Indonesian studies likewise describe the Pancasila Student Profile as requiring contextual and experiential processes embedded in school practice (Nurasiah et al., 2022; Salamor & Patra Ritiauw, 2023). The pattern should not, however, be equated with a controlled treatment effect because no control-group profile analysis was reported.

Theoretical Interpretation and Contribution

The findings can be interpreted through the constructivist and engagement-oriented foundations introduced earlier. Meaningful learning asks pupils to connect Pancasila concepts with prior knowledge and authentic social situations, a process consistent with constructivist and problem-based perspectives on knowledge construction (Hmelo-Silver, 2004; Loyens & Gijbels, 2008). Mindful learning adds a self-regulatory component by encouraging pupils to monitor understanding, recognize uncertainty, and take greater responsibility for learning; these processes align with major models of self-regulated learning (Panadero, 2017). Joyful learning concerns the emotional and social climate of instruction and can support participation when pupils experience appropriate autonomy, competence, and relatedness (Ryan & Deci, 2020). These processes are also consistent with multidimensional conceptions of student engagement encompassing behavioral, emotional, and cognitive participation (Fredricks et al., 2004). From an ICAP perspective, the strongest pedagogical value would arise when Deep Learning activities move beyond activity for its own sake and require constructive or interactive engagement with ideas (Chi & Wylie, 2014).

The present results are broadly consistent with Nurlailah and Julkifli (2025), who connect Deep Learning strategies with critical reasoning in the Pancasila Student Profile, and with Sari and Supriyadi (2025), who discuss critical and creative reasoning through Deep Learning-based differentiated instruction. They also complement the systematic review by Ambrosius Tode Peya Nia Do et al. (2025), which identifies potential for Deep Learning to support Pancasila

Student Profile character development. Relative to these studies, the contribution of the present manuscript is the use of an experimental and a control class in the same Grade IV school context and the simultaneous reporting of academic achievement and questionnaire-based profile change. The contribution remains bounded, however, because the profile outcome lacks a reported control-group comparison and the intervention-fidelity details are incomplete.

The comparison with international literature must be framed carefully because the pedagogical term Deep Learning is used differently across research traditions. Mystakidis et al. (2021), for example, synthesize deep and meaningful learning in technology-rich higher-education environments rather than elementary Pancasila Education. Similarly, active-learning research by Freeman et al. (2014) and Prince (2004) does not evaluate the Indonesian mindful-meaningful-joyful framework. The relevance of these international sources lies in shared mechanisms—cognitive engagement, active processing, interaction, meaningful context, and reflection—rather than in direct equivalence of interventions or populations. This distinction strengthens the theoretical positioning of the study and avoids overgeneralizing evidence across educational levels and cultural contexts.

From a practical perspective, the study suggests that elementary teachers can integrate academic and character-oriented objectives by designing lessons that require pupils to connect Pancasila content with authentic problems, explain reasoning, collaborate with peers, reflect on learning, and participate in a psychologically supportive classroom. Such practices are consistent with international evidence emphasizing participatory and dialogic approaches in citizenship and moral education (Arellano et al., 2026; Geboers et al., 2013; Schuitema et al., 2008) and with learning-and-development research that highlights the importance of relationships, meaningful tasks, agency, and supportive environments (Darling-Hammond et al., 2020). School leaders can support implementation by providing time for lesson planning, teacher collaboration, and access to appropriate resources. The reported internet and device constraints also indicate that Deep Learning should not be equated with technology-dependent instruction; discussion, printed scenarios, local cases, structured collaboration, and teacher-guided reflection can operationalize the core principles even in settings with limited digital infrastructure.

The practical significance of the findings depends on implementation quality. The comparatively strong post-test difference should not be interpreted as evidence that any activity labeled Deep Learning will produce the same result. Intervention research on social and emotional learning shows that implementation quality and the use of coherent, sequenced practices can influence outcomes (Durlak et al., 2011), while follow-up evidence indicates that developmental benefits may persist when competencies are effectively established (Taylor et al., 2017). For the present approach, teachers therefore need a clear relationship between lesson objectives, Pancasila Education content, the mindful-meaningful-joyful sequence, and observable learner responses. Future studies should document implementation fidelity, teacher actions, time on task, and contextual constraints so that outcome differences can be more confidently connected to the intended pedagogy.

Limitations and Transferability

Several limitations define the boundaries of the findings. First, the study involved one elementary school, two intact Grade IV classes, and 40 pupils selected purposively; the results therefore provide context-specific evidence and should not be generalized automatically to all Indonesian elementary schools. Second, individual randomization was not used, and detailed information about teacher assignment, instructional equivalence, and implementation fidelity was unavailable, leaving the possibility of class or teacher effects. Third, the principal between-group test concerned post-test achievement, whereas the Pancasila Student Profile evidence was

reported as experimental-group N-Gain without a corresponding control-group comparison. Fourth, the supplied manuscript did not report full psychometric results for the test and questionnaire, limiting independent evaluation of measurement validity and reliability. Fifth, the one-month period may be adequate to detect academic change but may be short for stable character-related dispositions that normally develop through repeated practice across contexts. Sixth, the use of Hake's normalized-gain bands for a profile questionnaire is descriptive and has not been established as a profile-specific validity standard. Finally, internet connectivity and digital-device constraints may have affected the implementation of some planned activities. Future studies should use larger multi-school samples, report instrument validation and ethics procedures in full, document implementation fidelity, analyze profile outcomes across groups, and consider longer follow-up periods.

CONCLUSION

Within the context of SD Inpres 2 Piru, the quasi-experimental evidence indicates that Grade IV pupils taught through the Deep Learning pedagogical approach achieved higher Pancasila Education post-test scores than pupils receiving conventional learning. The experimental group increased from M = 69.50 to M = 85.50, while the control group increased from M = 67.25 to M = 76.00; the post-test difference was statistically significant, $t(38) = 4.396$, $p < .001$, with a large standardized mean difference (Cohen's $d = 1.39$). The experimental group also showed an overall Pancasila Student Profile N-Gain of 0.6134, which falls in the medium range under the conventional normalized-gain criterion. This profile result should be understood as within-group improvement because an equivalent control-group questionnaire comparison was not reported. Taken together, the findings support mindful, meaningful, and joyful learning as a promising approach for strengthening academic learning while potentially supporting profile-related development, but the conclusions remain bounded by the single-school sample, nonrandomized classes, short intervention period, incomplete intervention and psychometric reporting, and the absence of a controlled profile-outcome comparison.

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