CJPE: *Cokroaminoto Journal of Primary Education*
https://e-journal.my.id/cjpe
Volume 9 | Nomor 4 | December |2026
e-ISSN: 2654-6434 dan p-ISSN: 2654-6426

Deep Learning Based on the Pancasila Student Profile and the Development of Gotong Royong Character among Grade III Elementary School Students

Muhammad Husni [1*], Nurhidayati [2], Ahmad Yasar Ramdan [3] Yul Alfian Hadi [4]

Corresponding Author
Elementary Teacher Education Program, Faculty of Teacher Training and Education, Universitas Hamzanwadi, Indonesia

Email:
mhd_husni@hamzanwadi.ac.id
nurhidayatiss036@gmail.com
ahmadyasar09@hamzanwadi.ac.id
alfianhadi@hamzanwadi.ac.id

Keywords:
Deep Learning, Pancasila Student Profil, ,Gotong Royong, Elementary Education, Character Education.

Abstract*. The urgency of this research is to strengthen the gotong royong (mutual cooperation) character of third-grade elementary school students through deep learning based on the Pancasila Student Profile. The development of gotong royong character is an important component of elementary education because students need opportunities to practice cooperation, care, responsibility, and contribution to collective activities. Preliminary observations at SD Negeri 1 Tebaban, East Lombok, West Nusa Tenggara, indicated that students' participation in group activities, peer interaction, role distribution, and willingness to assist classmates were not yet optimal. This study aimed to analyze changes in students' gotong royong character following the implementation of deep learning based on the Pancasila Student Profile. The study employed a quantitative approach with a One-Group Pretest–Posttest Design involving 24 Grade III students. The intervention was implemented over four sessions in August 2026 through contextual problem exploration, group discussions, collaborative work, problem solving, presentations, questioning, and reflection. Gotong royong character was measured using a questionnaire covering collaboration, care, and sharing. Of the 36 initial items, 22 were reported as valid, with a Cronbach's alpha coefficient of .913. The mean score increased from 79.58 (SD = 10.994) on the pretest to 90.42 (SD = 5.823) on the posttest. A paired-samples t-test indicated a significant difference, t(23) = −6.543, p < .001, with a mean difference of −10.833 and a 95% confidence interval of [−14.259, −7.408]. The findings indicate an increase in students' gotong royong scores following the intervention; however, this increase cannot be interpreted as definitive evidence of a causal effect because the study did not include a comparison group. Future studies should employ comparison groups, larger samples, stronger measurement procedures, and more rigorous documentation of intervention implementation.*

This work is licensed under a Creative Commons Attribution 4.0 International License

Introduction

Character education is an essential component of elementary education because schools are expected to develop not only academic competencies but also social behaviors that support responsible participation in collective life. At the elementary level, character development is closely shaped by students' everyday experiences,

including opportunities to interact, assume responsibilities, cooperate, and respond to shared situations. Therefore, character education requires more than transmitting moral concepts; it should provide learning environments where students can experience, practice, and reflect on character values through meaningful activities. Recent reviews of character education in Indonesian schools show that character formation occurs through classroom learning, school culture, habituation, extracurricular activities, and other school-based practices (Margaret et al., 2026). These findings suggest that character development becomes more meaningful when integrated into students' daily educational experiences rather than treated as a separate educational objective (Carsiwan, 2024; Rachmadyanti et al., 2024; Yulia et al., 2025).

Integrating character education into everyday learning is particularly important during the elementary years, when students develop patterns of social interaction and learn to participate in collective activities (Azzahra & Kaniadewi, 2025). Classroom experiences can encourage students to negotiate roles, consider different perspectives, complete shared tasks, assist others, and take responsibility for collective outcomes. Such experiences matter because social character depends not only on students' knowledge of appropriate behavior but also on repeated opportunities to practice it. Evidence from elementary education indicates that school culture and consistent character-building practices can support students' social and cooperative development, although character formation is also influenced by broader environments in which students live and learn (Rachmadyanti et al., 2024; Yulia et al., 2025). Therefore, classroom learning should extend beyond academic content by providing structured opportunities for students to practice socially responsible behavior.

Within the Indonesian educational context, the Pancasila Student Profile provides an important framework for integrating character development into learning. One of its dimensions, gotong royong, is particularly relevant to elementary education because it emphasizes students' capacity to work with others and participate constructively in collective activities. In classroom practice, gotong royong can be reflected through students' willingness to collaborate, demonstrate care for others, share responsibilities and resources, and contribute to the achievement of shared goals. Empirical research in elementary classrooms has demonstrated that collaboration, care, and sharing can become visible through learning activities that intentionally integrate the gotong royong dimension of the Pancasila Student Profile. Nevertheless, the development of these behaviors is not necessarily uniform across all students or indicators, and some aspects may require sustained teacher guidance, reinforcement, and opportunities for practice (Cipriano et al., 2023).

The development of *gotong royong* is influenced by the social environments surrounding students, including school experiences, family settings, community contexts, habits, and patterns of social interaction. Research indicates that students' collaborative character develops through multiple interacting factors rather than classroom instruction alone (Taylor et al., 2017). This has important implications for classroom practice. If students are expected to demonstrate cooperation and shared responsibility, learning activities should provide repeated and structured opportunities to practice these behaviors. Simply explaining the meaning of *gotong royong* may be insufficient when students have limited opportunities for direct collaboration. Therefore, learning design serves as an important mechanism for translating character values into observable student behavior.

Cooperative and collaborative learning approaches are particularly relevant in this regard because they position students as participants in shared learning processes. Group activities can require students to communicate ideas, distribute responsibilities, coordinate actions, solve problems collectively, and contribute to common outcomes. These processes provide opportunities for social skills to develop through direct interaction rather than through verbal instruction alone. A systematic review of cooperative learning in elementary education indicates that cooperative learning models can support collaboration and social skills, while recent empirical evidence also demonstrates the potential of cooperative and collaborative approaches to strengthen teamwork, communication, and peer interaction among elementary students (Pebriana et al., 2025; Supratman et al., 2025).

Project-oriented activities can provide opportunities for students to complete shared tasks, assume responsibilities, negotiate contributions, and produce collective outcomes. Activities such as *Market Day* have been associated with cooperation, responsibility, and mutual participation among elementary students when intentionally connected to the *gotong royong* dimension (Rahmawati et al., 2024). These approaches are increasingly relevant to discussions of deep learning in Indonesian education. In this study, deep learning refers to a pedagogical approach rather than computational deep learning in artificial intelligence. It emphasizes meaningful, mindful, active, and joyful learning, encouraging students to engage with content, connect learning with contextual situations, participate actively, and reflect on their experiences. Deep learning is therefore conceptualized as an integrated pedagogical framework that moves beyond knowledge transmission toward deeper understanding, active engagement, meaningful experiences, and reflection (Kurnianingsih et al., 2026). These characteristics make it relevant to character education because students can experience character values through authentic learning activities while developing academic understanding.

The relationship between deep learning and the Pancasila Student Profile has gained increasing attention in Indonesian educational literature. Deep learning has been proposed as a pedagogical strategy for strengthening Pancasila values by connecting classroom learning with contextual situations, problem solving, active participation, and reflection (Jamaludin, 2025). Systematic reviews also indicate its potential to support character development and strengthen the Pancasila Student Profile when learning involves meaningful activities and active engagement with real or contextual problems (Yunitasari et al., 2025). Another systematic review highlights the integration of deep learning and project-based learning as a potentially useful framework for character development through meaningful experiences, active participation, and collaborative tasks in elementary education (Miller et al., 2020). Collectively, these findings provide a conceptual basis for examining deep learning not only as an approach to cognitive development but also as a context for strengthening students' social character.

Recent studies have begun to explore the implementation of deep learning and character education across different elementary-school learning contexts. Research in arts education, for example, has discussed deep learning as a strategy for embedding character values through active, contextual, and reflective learning experiences (Komalasari et al., 2025). Other recent research has examined the integration of deep learning with character education in elementary learning contexts, further indicating that meaningful and active learning can provide opportunities for students to connect educational content with values and behavior. Research on the Pancasila Student Profile has likewise demonstrated that the gotong royong dimension can be developed through

structured learning experiences involving collaboration, care, and sharing, including among Grade III students (Ferrero et al., 2021). Taken together, these studies indicate that the intersection between learning design, deep learning, and character development is becoming increasingly relevant in elementary education.

Nevertheless, evidence directly examining changes in gotong royong following the implementation of deep learning remains relatively limited, particularly when the outcome is examined quantitatively within a specific Grade III classroom. Existing studies also differ substantially in their conceptualization of deep learning, instructional model, educational level, outcome measures, and research design. For example, research using the Active Deep Learner Experience approach found a significant relationship with students' gotong royong attitudes in a quasi-experimental context (Firoh et al., 2025). This finding provides relevant empirical support because it directly connects a deep-learning-related pedagogical approach with gotong royong. However, the approach and research design differ from those employed in the present study.

More recent evidence provides an additional point of comparison. A quasi-experimental study examined Project-Based Learning combined with a deep learning approach to strengthen the Pancasila Student Profile, including critical reasoning, gotong royong, and creativity. The study used a nonequivalent control-group design and therefore provides evidence under a substantially different methodological structure from the present research. The difference is important because the present study does not examine Project-Based Learning as a distinct instructional model and does not employ a control group. Instead, it examines changes in students' gotong royong scores following a classroom learning sequence incorporating contextual problem exploration, group discussion, collaborative work, problem solving, presentation, questioning, and reflection. The present study therefore complements, rather than replicates, previous research by examining a different instructional configuration and classroom context.

The broader evidence on active and project-oriented learning also indicates the importance of interpreting findings according to research design and contextual conditions. A meta-analysis involving 66 experimental or quasi-experimental studies reported generally positive effects of project-based learning on student learning outcomes, while also identifying variation according to instructional and contextual factors (Zhang & Ma, 2023). At the same time, a systematic review focusing on kindergarten and elementary education reported inconclusive evidence and methodological limitations in the project-based learning literature, including weaknesses in intervention reporting and methodological rigor (Ferrero et al., 2021). These findings suggest that active, collaborative, and project-oriented learning should not automatically be assumed to produce uniform outcomes. Instead, their effects should be examined through context-specific empirical studies with transparent intervention procedures and appropriate measurement strategies. This consideration is particularly important for character education, where behavioral development may be influenced by classroom climate, teacher practices, peer relationships, and students' previous experiences.

The empirical problem addressed in the present study emerged from preliminary observations conducted at SD Negeri 1 Tebaban, East Lombok, West Nusa Tenggara, on 6 November 2025. The observations indicated that the development of gotong royong among Grade III students was not yet optimal. Students showed limited participation in group activities, restricted interaction with peers, a tendency to complete tasks individually, difficulties in distributing responsibilities, and limited willingness to assist

classmates. These conditions are relevant to the three principal aspects of gotong royong examined in the present study: collaboration, care, and sharing. The observed classroom conditions suggest that students needed learning experiences that could provide more direct and repeated opportunities to communicate, coordinate, assume shared responsibilities, help peers, and contribute to collective activities.

The problem is therefore not simply whether students understand the concept of gotong royong, but whether classroom learning can provide sufficient opportunities for them to practice behaviors associated with the concept. A learning approach that incorporates contextual problems, group interaction, collaborative work, problem solving, presentation, questioning, and reflection may create a classroom environment in which students repeatedly encounter situations requiring cooperation and shared participation. Such activities are consistent with the broader characteristics attributed to deep learning, particularly meaningful engagement, active participation, contextual learning, and reflection (Kurnianingsih et al., 2026; Jamaludin, 2025). However, the presence of these characteristics does not by itself establish that the approach causes character development. Empirical measurement is therefore required to examine whether students' scores differ before and after the learning intervention.

The present study addresses an empirical and contextual gap by examining deep learning based on the Pancasila Student Profile in a specific Grade III elementary-school context at SD Negeri 1 Tebaban, East Lombok. Rather than claiming novelty as the first study of deep learning, the Pancasila Student Profile, or *gotong royong*, this study contributes quantitative evidence on changes in students' *gotong royong* scores following a deep-learning-based learning sequence. The study focuses on three observable dimensions of *gotong royong*: collaboration, care, and sharing. This contextual focus is relevant because previous studies have involved different student populations, instructional models, subjects, and research designs, limiting direct comparison.

Accordingly, the study aimed to examine changes in the measured *gotong royong* character of Grade III students following the implementation of deep learning based on the Pancasila Student Profile at SD Negeri 1 Tebaban, East Lombok, West Nusa Tenggara. Specifically, it examined whether students' *gotong royong* scores differed between pretest and posttest. A One-Group Pretest–Posttest Design was employed with 24 Grade III students. Because no control or comparison group was included, the study was intended to identify within-group pre–post change rather than establish a definitive causal effect. The findings therefore provide preliminary quantitative evidence regarding the potential contribution of deep-learning-based classroom experiences to *gotong royong* development.

Method

Design and Participants

This study employed a quantitative approach using a One-Group Pretest–Posttest Design. The design consisted of a pretest (O_1), intervention (X), and posttest (O_2), with the same group of students completing the gotong royong measurement before and after the intervention. The participants were 24 Grade III students at SD Negeri 1 Tebaban, Tebaban Village, Suralaga District, East Lombok Regency, West Nusa Tenggara, comprising 12 male and 12 female students. Saturated sampling was employed because all students in the participating Grade III group were included in the study. The research

was conducted in August 2026. The pretest was administered on 4 August 2026, followed by intervention sessions on 6, 11, 13, and 18 August 2026. The posttest was administered on 18 August 2026. The design was used to examine within-group changes in students' measured gotong royong scores. Because no control or comparison group was included, the design does not adequately control for alternative explanations such as history, maturation, testing, and instrumentation effects. Accordingly, the findings are interpreted as pre–post change rather than definitive causal evidence.

Measures and Data Collection

Data were collected using a structured questionnaire as the principal measurement instrument and classroom observation as a complementary source of contextual information. The questionnaire was developed to measure students' *gotong royong* character across three behavioral dimensions: collaboration, care, and sharing. These dimensions were selected because they represent observable forms of cooperative and socially responsible behavior relevant to the *gotong royong* dimension of the Pancasila Student Profile (Cipriano et al., 2023; Ferrero et al., 2021). Accordingly, the measurement focused on students' behavioral manifestations of *gotong royong* rather than their conceptual knowledge of the value.

The initial questionnaire contained 36 items. Before being administered to the research participants, the instrument underwent empirical item validation using Pearson's product-moment correlation. The validity testing involved 22 students who were not included in the main research sample, thereby avoiding overlap between the validation group and the intervention participants. Item-level validity was evaluated by examining the correlation between each item score and the corresponding total score. Based on the empirical validation results, 22 of the 36 items met the validity criterion and were retained, whereas 14 items were classified as invalid and excluded from the final instrument. The retained items therefore constituted the questionnaire used to assess students' *gotong royong* scores in the main study.

The internal consistency of the retained instrument was assessed using Cronbach's alpha. The resulting coefficient was .913, indicating high internal consistency among the retained items. This reliability evidence supports the use of the final questionnaire for measuring the targeted *gotong royong* construct in the study context. The same final instrument was administered at both measurement points to ensure comparability between the pretest and posttest scores. The pretest was administered before the implementation of the deep-learning-based learning activities, whereas the posttest was administered after completion of the intervention sequence. Both assessments were conducted under comparable classroom conditions to minimize differences attributable to the measurement procedure rather than to changes in students' responses.

Classroom observation was conducted during the intervention as a complementary source of information concerning students' behavioral engagement. Observation focused on manifestations of cooperation, care, and sharing during learning activities, particularly when students participated in group discussions, collaborative tasks, problem solving, and other shared classroom activities. However, because the available research records contain inconsistent information regarding the number and specification of observation indicators, the observation data were not treated as the principal quantitative outcome and were not incorporated into the inferential statistical analysis. Instead, observation served a contextual and supportive function in documenting students' behavioral participation during the learning process.

Data Analysis

Data analysis was conducted using descriptive and inferential statistics. Descriptive analysis was first performed to summarize students' *gotong royong* scores at the pretest and posttest stages. The descriptive statistics included the number of observations, minimum and maximum scores, mean, and standard deviation. These statistics were used to describe the distribution and overall change in students' scores before and after the implementation of the learning intervention.

Prior to inferential testing, the distribution of the pretest and posttest scores was examined using the Shapiro–Wilk test. This test was selected because the study involved a relatively small sample of 24 students. The normality assessment was conducted separately for the pretest and posttest score distributions. The results were considered when determining the appropriateness of subsequent parametric analysis. However, the available statistical output did not include a separate Shapiro–Wilk test for the paired difference scores. Therefore, no additional normality result was reconstructed from the available data, and this limitation was explicitly acknowledged in interpreting the statistical procedure.

Because the same students were measured before and after the intervention, the primary inferential analysis employed a paired-samples *t*-test. This test was used to determine whether the mean *gotong royong* score differed significantly between the pretest and posttest measurements. The analysis was conducted using a two-tailed significance level of $\alpha = .05$. Statistical processing was performed using SPSS. Where SPSS displayed the significance value as Sig. (2-tailed) = .000, the result was reported in accordance with statistical reporting conventions as $p < .001$ rather than $p = .000$.

The statistical analysis was interpreted in accordance with the One-Group Pretest–Posttest Design employed in the study. A statistically significant difference between the pretest and posttest indicates evidence of within-group change following the learning sequence. However, because the study did not include a control or comparison group, the analysis cannot isolate the effect of the intervention from other factors that may have influenced students' scores over time. Consequently, the findings are interpreted as evidence of pretest–posttest change associated with the study period and intervention context rather than as definitive evidence of a causal intervention effect. This distinction is particularly important for maintaining an appropriate level of inference from the study design.

Ethical Considerations

The study was conducted with institutional and site-level authorization. Research authorization was issued by Universitas Hamzanwadi through Letter No. 595/UH.FIP/LT/2026, dated 18 July 2026. Permission from SD Negeri 1 Tebaban was documented through Letter No. 421.2/037/SD1TBBNVIII/2026, A school-issued research certificate dated 20 August 2026 confirmed that the research had been conducted at SD Negeri 1 Tebaban. In addition, the research was formally notified to the Regional Development Planning Agency (BAPPEDA) of East Lombok Regency through Letter No. 000.9/2018/PD/VII/2026, dated 27 July 2026. These documents establish institutional and administrative authorization for conducting the study. However, these research permissions are distinguished from formal ethical approval by an institutional ethics committee. No separate formal ethical approval number is reported because such documentation has not been identified in the available research materials.

Results and Discussion

Results

Descriptive Statistics

The analysis involved 24 Grade III students. The descriptive statistics of the gotong royong scores are presented in Table 1.

Table 1. *Descriptive Statistics of Gotong Royong Scores*

Statistic	Pretest	Posttest
N	24	24
Minimum	60	77
Maximum	96	99
Mean	79.58	90.42
SD	10.994	5.823

Based on Table 1, the pretest mean was 79.58 (SD = 10.994), with scores ranging from 60 to 96. Following the intervention, the posttest mean increased to 90.42 (SD = 5.823), with scores ranging from 77 to 99. The difference between the pretest and posttest means was 10.84 points. The standard deviation decreased from 10.994 to 5.823. Thus, the posttest scores were more concentrated around the mean than the pretest scores. The descriptive results therefore indicate both an increase in the average measured gotong royong score and a reduction in score dispersion.

Intervention Implementation

The intervention was implemented during four learning sessions on 6, 11, 13, and 18 August 2026. The learning activities involved contextual problem exploration, group discussion, collaborative work, problem solving, group presentation, questioning, and reflection. Students participated in group tasks and were required to communicate and coordinate with peers while completing the learning activities. The intervention was structured to provide opportunities for students to practice cooperation, care, shared responsibility, and sharing during classroom activities. The intervention implementation was consistent with the intended deep-learning characteristics of active engagement, contextual learning, meaningful experience, and reflection. No inferential statistical analysis was performed on the observation data because the available research documentation contains unresolved inconsistencies concerning the observation instrument.

Normality Test

Table 2. *Shapiro–Wilk Normality Test*

Measurement	W	df	p
Pretest	.926	24	.081
Posttest	.953	24	.317

Based on Table 2, the Shapiro–Wilk test produced W = .926, p = .081 for the pretest and W = .953, p = .317 for the posttest. Both p-values exceeded the .05 significance level, indicating no statistically significant evidence of non-normality in either score distribution. These results provide descriptive evidence regarding the distribution of the pretest and posttest scores. However, the available analysis did not include a separate normality test for the paired difference scores.

Paired-Samples t-Test

Table 3. *Paired-Samples t-Test of Gotong Royong Scores*

Comparison	Mean Difference	SD	SE	95% CI Lower	95% CI Upper	t	df	p
Pretest – Posttest	−10.833	8.112	1.656	−14.259	−7.408	−6.543	23	< .001

Based on Table 3, the paired-samples t-test showed a statistically significant difference between the pretest and posttest gotong royong scores, $t(23) = -6.543$, $p < .001$. The mean difference was −10.833 because the analysis was calculated as pretest minus posttest. The 95% confidence interval ranged from −14.259 to −7.408. The negative direction of the mean difference indicates that the posttest scores were higher than the pretest scores. This result is consistent with the increase in the descriptive mean from 79.58 to 90.42. Thus, the statistical analysis indicates a significant pre–post increase in the measured gotong royong scores.

Discussion

The main finding of this study was a statistically significant increase in students' measured gotong royong scores following participation in the deep-learning-based learning sequence. The mean score increased from 79.58 (SD = 10.994) at pretest to 90.42 (SD = 5.823) at posttest, with a significant pre–post difference, $t(23) = -6.543$, $p < .001$. This result indicates that the participating students demonstrated higher measured gotong royong scores after the learning sessions than before them. Nevertheless, because the study employed a One-Group Pretest–Posttest Design without a comparison group, the finding should be interpreted as evidence of within-group change rather than definitive evidence that the intervention itself caused the observed improvement. Alternative explanations, including maturation, testing effects, concurrent classroom experiences, and other contextual influences, cannot be completely excluded.

One plausible explanation for the observed change is the active and contextual structure of the learning activities. Deep learning in the pedagogical sense emphasizes meaningful, mindful, active, and reflective learning experiences in which students engage with learning content rather than merely receive information. Such an orientation creates opportunities for students to connect classroom learning with situations that require participation, problem solving, interaction, and reflection. In the present study, students were engaged in contextual problem exploration, group discussion, collaborative work, problem solving, presentations, questioning, and reflection. These activities created repeated opportunities for students to communicate with peers, coordinate responsibilities, contribute to shared tasks, and respond to the needs of others.

The pedagogical characteristics of meaningful engagement, active participation, contextual learning, and reflection are consistent with the conceptualization of deep learning as an integrated educational framework (Kurnianingsih et al., 2026). The integration of deep learning with the Pancasila Student Profile provides a further explanation for the relevance of the intervention to gotong royong. The Pancasila Student Profile positions gotong royong as a dimension that can be developed through students' participation in collective activities and their ability to cooperate with others. Learning that incorporates contextual problems and active participation can provide situations in which these values are enacted rather than merely explained. Deep learning has consequently been discussed as a pedagogical orientation that can connect

learning experiences with Pancasila values through contextual engagement, problem solving, and reflection (Jamaludin, 2025). Systematic literature has likewise identified the potential of deep learning to support character development and the strengthening of the Pancasila Student Profile, particularly when students are actively involved in meaningful learning experiences (Yunitasari et al., 2025; Miller et al., 2020).

The present finding is also compatible with empirical evidence concerning deep-learning-oriented approaches and gotong royong. Previous research using the Active Deep Learner Experience approach reported a significant relationship with students' gotong royong attitudes in an elementary-school context. This provides relevant empirical support because the outcome examined in that study was directly related to gotong royong. However, the previous research employed a quasi-experimental factorial design, whereas the present study used a single-group pre–post design. The similarity in direction therefore strengthens the plausibility that active and reflective learning experiences can provide a productive context for gotong royong development, but it does not establish that an identical causal mechanism operated in the present study (Firoh et al., 2025).

The role of collaboration in the present findings is further supported by research on the gotong royong dimension of the Pancasila Student Profile. Elementary-school learning activities that explicitly involve collaboration, caring, and sharing can provide observable contexts for students to enact gotong royong. Cooperative learning structures can encourage students to distribute responsibilities, assist peers, communicate ideas, and work toward shared outcomes, thereby providing behavioral opportunities that correspond closely to the dimensions measured in the present study (Cipriano et al., 2024). Similarly, project-oriented activities such as Market Day have been reported to create opportunities for students to practice cooperation, mutual assistance, responsibility, and participation in collective tasks (Rahmawati et al., 2024). Evidence from a Grade III elementary-school context is particularly relevant because collaboration, caring, and sharing have also been examined as components of the gotong royong dimension among students at the same grade level (Ferrero et al., 2021).

The collaborative character of the intervention is also consistent with broader evidence on cooperative and collaborative learning. Cooperative learning can provide structured opportunities for students to communicate, coordinate tasks, exchange ideas, and develop social skills through direct interaction. A systematic review of elementary-school research reported that cooperative learning models can support collaboration and social skills, while recent evidence has emphasized task distribution, peer discussion, exchange of ideas, and shared decision making as important features of cooperative and collaborative learning (Pebriana et al., 2025; Supratman et al., 2025). These mechanisms are particularly relevant to gotong royong because the construct is expressed through interaction and collective participation rather than through individual academic performance alone. Thus, the collaborative activities incorporated into the present learning sequence may have provided students with more frequent opportunities to practice the behaviors represented in the measured construct. The findings also correspond with broader literature concerning deep learning and character education, although the evidence should be interpreted according to the differences among instructional contexts.

Recent research has examined deep learning as a means of embedding character values through meaningful, active, contextual, and reflective learning experiences. Evidence from language and arts education suggests that deep-learning-oriented

approaches can provide opportunities for students to connect learning activities with character values and reflective experiences (Madeamin & Sahriani, 2025; Komalasari et al., 2025). Systematic evidence has likewise highlighted the potential contribution of deep learning integrated with project-oriented learning to character development. These studies support the pedagogical plausibility of the present findings, but they do not constitute direct evidence that the specific intervention used at SD Negeri 1 Tebaban caused the observed change in gotong royong scores (Miller et al., 2020).

The closest recent empirical comparison is research examining Project-Based Learning combined with a deep learning approach for strengthening dimensions of the Pancasila Student Profile, including gotong royong. That study used a nonequivalent control-group design, providing a stronger basis for comparing learning conditions than the single-group design used in the present study. Although both studies reported outcomes consistent with improvement following learning involving a deep-learning approach, their instructional configurations and methodological structures were different. The present study did not investigate Project-Based Learning as a distinct instructional model; instead, it implemented a learning sequence consisting of contextual problem exploration, group discussion, collaborative work, problem solving, presentation, questioning, and reflection. Consequently, the present findings complement previous evidence by providing context-specific evidence of pre–post change rather than comparative evidence of intervention effectiveness.

The broader literature on project-oriented and active learning further supports the need for methodological caution. A meta-analysis of 66 experimental and quasi-experimental studies reported generally positive effects of Project-Based Learning on student learning outcomes, although the magnitude of effects varied according to instructional and contextual characteristics. In contrast, a systematic review focused on kindergarten and elementary-school students found mixed and inconclusive evidence and identified methodological limitations in parts of the Project-Based Learning literature. Taken together, these findings suggest that active, collaborative, and project-oriented learning can be promising, but their outcomes should not be assumed to be uniform across settings. Transparent descriptions of intervention procedures, appropriate measurement, and research designs capable of addressing alternative explanations remain important when evaluating educational interventions (Zhang & Ma, 2023; Ferrero et al., 2021).

The development of gotong royong should also be understood within the broader social environment of elementary-school students. Students' collaborative behaviors can be influenced by family experiences, community environments, school culture, habitual practices, and patterns of interaction that extend beyond a particular classroom intervention. Consequently, the improvement observed in the present study may reflect not only the learning activities implemented during the research period but also other experiences occurring before or during the intervention. Research on the development of collaboration within the Pancasila Student Profile has emphasized the influence of family, community, school, and habitual factors on students' collaborative attitudes (Taylor et al., 2017). Character education research similarly indicates that character formation is strengthened through school culture, habituation, classroom practices, and continuous educational experiences rather than through isolated instructional activities (Carsiwan, 2024; Rachmadyanti et al., 2024; Yulia et al., 2025).

The reduction in score variability provides an additional descriptive observation. The standard deviation decreased from 10.994 at pretest to 5.823 at posttest, indicating

that posttest scores were more concentrated around the mean. This pattern may indicate greater similarity among students' measured scores after the learning sessions. However, the available data do not establish the reason for this reduction. It could reflect changes in students' responses, greater familiarity with the questionnaire, regression toward the mean, classroom processes, or other contextual influences. Therefore, the reduction in dispersion should be regarded as a descriptive feature of the observed data rather than as independent evidence of intervention effectiveness.

The findings have practical implications for elementary-school instruction. Gotong royong can be incorporated directly into regular classroom activities by designing learning tasks that require students to communicate, distribute responsibilities, assist peers, solve problems collectively, and reflect on their shared experiences. Such an approach allows character values to be practiced through classroom behavior rather than presented only as abstract concepts. The integration of character education into routine learning and school culture is consistent with research emphasizing that character formation is more sustainable when students encounter character values repeatedly across their educational experiences (Utami & Sanjaya, 2025; Yulia et al., 2025). In this context, deep-learning-oriented activities may provide a useful pedagogical framework for embedding gotong royong within subject learning without treating character education as a separate instructional component.

The findings also indicate the importance of deliberately structuring collaborative learning. Merely placing students in groups does not necessarily guarantee meaningful cooperation. Teachers need to establish shared tasks, clarify responsibilities, encourage equitable participation, facilitate peer interaction, and provide opportunities for reflection. These elements are consistent with evidence that cooperative and collaborative learning can support social skills when students are actively engaged in discussion, task distribution, and shared decision making (Pebriana et al., 2025; Supratman et al., 2025). For gotong royong specifically, collaborative learning may be most meaningful when students are required not only to complete a common task but also to recognize the contribution and needs of their peers.

Several limitations must be considered when interpreting the findings. First, the absence of a control or comparison group prevents the study from distinguishing the contribution of the intervention from alternative explanations such as history, maturation, testing, and instrumentation effects. A statistically significant difference between pretest and posttest therefore cannot by itself establish causal effectiveness. Methodological literature has specifically cautioned that one-group pretest–posttest designs provide limited protection against such alternative explanations (Bierer et al., 2025). Second, the sample consisted of only 24 Grade III students from one school, which limits the generalizability of the findings to other elementary-school populations, grades, and educational settings.

Third, some research records contain unresolved inconsistencies concerning aspects of the observation instrument and measurement documentation. Observation data were therefore not treated as the principal inferential outcome. Future studies should provide a fully documented observation protocol, including the number of indicators, scoring procedures, and evidence of validity and reliability. Fourth, the available normality analysis assessed the pretest and posttest distributions separately rather than directly testing the distribution of paired difference scores. Future studies should explicitly assess the paired differences when evaluating the assumptions underlying a paired-samples t-test. The present study reports the available analysis

transparently without reconstructing or estimating an unreported difference-score test.

Fifth, the study relied primarily on a self-report questionnaire to measure gotong royong. Although the instrument demonstrated a Cronbach's alpha coefficient of .913 and 22 of the initial 36 items were reported as valid, additional evidence concerning content validity, construct validity, scoring procedures, and behavioral corroboration would strengthen confidence in the measurement. Future research could combine questionnaires with structured behavioral observations, teacher assessments, peer assessments, or other appropriate measures to reduce dependence on a single source of self-reported data. Such methodological strengthening would also help determine whether changes in questionnaire scores correspond to observable changes in students' collaborative behavior.

Overall, the statistically significant pre–post increase provides preliminary quantitative evidence that the participating Grade III students had higher measured gotong royong scores after experiencing the deep-learning-based classroom sequence. The direction of the finding is compatible with existing evidence concerning deep learning, collaborative learning, character education, and the Pancasila Student Profile. However, the evidence should be interpreted within the methodological boundaries of the study. The One-Group Pretest–Posttest Design does not permit definitive causal attribution, and the observed change may have been influenced by factors beyond the intervention. The primary contribution of this study is therefore not to establish causal effectiveness but to provide context-specific empirical evidence and to illustrate how contextual, collaborative, problem-solving, and reflective activities can be intentionally incorporated into elementary learning to create opportunities for practicing gotong royong. Future research using comparison groups, larger and more diverse samples, stronger measurement procedures, and systematic intervention-fidelity assessment is needed to determine whether similar changes are observed under more rigorous research conditions.

Conclusion

This study found a statistically significant increase in the measured gotong royong scores of 24 Grade III students following the implementation of deep learning based on the Pancasila Student Profile. The mean score increased from 79.58 (SD = 10.994) on the pretest to 90.42 (SD = 5.823) on the posttest, and the paired-samples t-test indicated a significant pre–post difference, $t(23) = -6.543$, $p < .001$. The intervention incorporated contextual problem exploration, group discussion, collaborative work, problem solving, presentation, questioning, and reflection, thereby providing students with opportunities to practice collaboration, care, and sharing. The findings provide preliminary quantitative evidence that deep learning based on the Pancasila Student Profile may support the development of gotong royong in an elementary-school context. However, the One-Group Pretest–Posttest Design does not permit definitive causal attribution because the study lacked a comparison group and could not control for alternative explanations such as maturation, history, testing effects, and instrumentation. Future studies should employ quasi-experimental or experimental comparison designs, larger and more diverse samples, rigorous instrument validation, explicit assessment of paired difference-score assumptions, and detailed intervention-fidelity procedures. Within the limits of the present design, contextual, collaborative, and reflective learning activities represent a practical avenue for embedding gotong royong within everyday elementary classroom instruction.

References

Cipriano, C., Strambler, M. J., Naples, L. H., Ha, C., Kirk, M., Wood, M., Sehgal, K., Zieher, A. K., Eveleigh, A., McCarthy, M., Funaro, M., Ponnock, A., Chow, J. C., & Durlak, J. (2023). The state of evidence for social and emotional learning: A contemporary meta-analysis of universal school-based SEL interventions. *Child Development*, 94(5), 1181–1204. https://doi.org/10.1111/cdev.13968

Ahadi, G. D., & Zain, N. N. L. E. (2023). The simulation study of normality test using Kolmogorov-Smirnov, Anderson-Darling, and Shapiro-Wilk. *Eigen Mathematics Journal, 6*(1), 11–19. https://doi.org/10.29303/emj.v6i1.131

Yunitasari, D., Lasmawan, I. W., Arnyana, I. B. P., & Ardana, I. M. (2025). Innovative learning: Problem-based learning enhances character and learning outcomes in elementary schools. *Education Policy Analysis Archives*. https://doi.org/10.22521/edupij.2025.16.202

Azzahra, S., & Kaniadewi, N. (2025). Building vocabulary in primary school students using contextual teaching learning model. Cokroaminoto Journal of Primary Education, 8(2), 1090–1100. https://doi.org/10.30605/cjpe.8.2.2025.6459

Bierer, S. B., Beck Dallaghan, G., Borges, N. J., Brondfield, S., Fung, C. C., Huggett, K. N., Teal, C. R., Thammasitboon, S., & Colbert, C. Y. (2025). Moving beyond simplistic research design in health professions education: What a one-group pretest-posttest design will not prove. *MedEdPORTAL, 21*, 11527. https://doi.org/10.15766/mep_2374-8265.11527

Carsiwan. (2024). Trends in character education for elementary, middle and high school students in Indonesia: Systematic literature review. *Indonesian Journal of Educational Research and Review, 7*(2), 240–252. https://doi.org/10.23887/ijerr.v7i2.80764

Taylor, R. D., Oberle, E., Durlak, J. A., & Weissberg, R. P. (2017). Promoting positive youth development through school-based social and emotional learning interventions: A meta-analysis of follow-up effects. *Child Development*, 88(4), 1156–1171. https://doi.org/10.1111/cdev.12864

Ferrero, M., Vadillo, M. A., & León, S. P. (2021). Is project-based learning effective among kindergarten and elementary students? A systematic review. *PLOS ONE, 16*(4), e0249627. https://doi.org/10.1371/journal.pone.0249627

Firoh, L. M., Raharjo, T. J., Sukasih, S., Subali, B., & Widiarti, N. (2025). A systematic review of the implementation of Projek Penguatan Profil Pelajar Pancasila (P5) in Indonesian schools (2020–2024). *Journal of Educational Sciences*. https://doi.org/10.31258/jes.9.4.p.2152-2163

Jamaludin, J. (2025). Embodying deep learning in Pancasila Student Profile. *Journal of Education and Learning Mathematics Research, 6*(1), 27–30. https://doi.org/10.37303/jelmar.v6i1.3823

Komalasari, H., Barnas, B., & Sabaria, R. (2025). Deep learning in dance education: A strategy for instilling character values in today's elementary school children. *Jurnal Kependidikan: Jurnal Hasil Penelitian dan Kajian Kepustakaan di Bidang Pendidikan, Pengajaran dan Pembelajaran, 11*(3), 971–980. https://doi.org/10.33394/jk.v11i3.17069

Kurnianingsih, E., Prayitno, H. J., Mu'ti, A., Baidhawy, Z., & Jufriansah, A. (2026). Deep learning as an integrated pedagogical framework: Synthesizing mindful, meaningful, and joyful learning for transformative educational experiences. *Journal of Deep Learning, 2*(2), 125–143. https://doi.org/10.23917/jdl.v2i2.16008

Madeamin, R. M., & Sahriani, S. (2025). Transformation of Indonesian language learning: Integration of deep learning strategy with character education in the era of independent learning. *International Journal of Nusantara Islam, 13*(2). https://doi.org/10.15575/ijni.v13i2.46155

Miller, E. C., & Krajcik, J. S. (2020). Promoting deep learning through project-based learning: A design problem. *Disciplinary and Interdisciplinary Science Education Research*, 2, Article 7. https://doi.org/10.1186/s43031-019-0009-6

Margaret, N. I., Susilawati, & Yulianawati, D. (2026). Implementation of PhET-supported inquiry learning to support elementary school students' learning motivation in simple electric circuits. *Cokroaminoto Journal of Primary Education*, 9(4). https://doi.org/10.30605/cjpe.9.4.2026.9644

Ferrero, M., Vadillo, M. A., & León, S. P. (2021). Is project-based learning effective among kindergarten and elementary students? A systematic review. *PLOS ONE*, 16(4), Article e0249627. https://doi.org/10.1371/journal.pone.0249627

Pebriana, P. H., Misnati, K., Jeniari, F., Azzikra, R., Nurhayati, N., Andina, F. Z., Fitri, D. W., & Zhefira, N. (2025). Systematic literature review on the effectiveness of the cooperative learning models in improving collaboration and social skills of elementary school students. *TOFEDU: The Future of Education Journal, 4*(3), 677–682. https://doi.org/10.61445/tofedu.v4i3.424

Rachmadyanti, P., Bintang Nusantara, A., Setiawan, R., Suprayitno, & Kiettikunwong, N. (2024). GANGSTER SI CANTIK program: The implementation of character building for elementary school students. *Jurnal Prima Edukasia, 12*(2), 315–324. https://doi.org/10.21831/jpe.v12i2.63155

Rahmawati, D., Saputro, B. A., Utami, S., & Roshayanti, F. (2024). Analysis of Pancasila Student Profile of mutual cooperation elements through the Market Day project in Grade IV elementary school students. *Didaktika: Jurnal Kependidikan, 18*(2), 133–142. https://doi.org/10.30863/didaktika.v18i2.7326

Supratman, S., Mariani Ramlan, A., Ode Sirad, L., & Bonyah, E. (2025). Optimizing social skills of elementary school students through cooperative and collaborative learning approaches. *EduStream: Jurnal Pendidikan Dasar, 9*(2), 202–213. https://doi.org/10.26740/eds.v9n2.p202-213

Utami, N. P. A., & Sanjaya, D. B. (2025). Civic education as a development of character education for elementary school students. *Indonesian Journal of Instruction, 6*(1), 89–97. https://doi.org/10.23887/iji.v6i1.95784

Yulia, R., Hidayati, A., Miaz, Y., & Muhammadi. (2025). Character education analysis through school culture in elementary schools. *Indonesian Research Journal in Education, 9*(1), 265–277. https://doi.org/10.22437/irje.v9i01.31647

Zhang, L., & Ma, Y. (2023). A study of the impact of project-based learning on student learning effects: A meta-analysis study. *Frontiers in Psychology, 14*, 1202728. https://doi.org/10.3389/fpsyg.2023.1202728