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The Effectiveness of the *Problem Based Learning* Model Supported by the Komisat Media on Elementary School Students' Learning Outcomes in Pancasila Education

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Abstract

This study was motivated by the fact that Pancasila Education instruction in the fourth grade at SD N Mangunrekso 02 still tends to be teacher-centered, the use of instructional media is not yet optimal, and the involvement of some students in the learning process still needs to be improved. This study aims to analyze the effectiveness of the Problem-Based Learning model assisted by the KOMISAT (Komik Misi Anak Hebat) media on the Pancasila Education learning outcomes of elementary school students. The study used a quantitative pre-experimental approach with a one-group pretest-posttest design involving 24 fourth-grade students at SD N Mangunrekso 02 during the 2026/2027 school year. Data were collected through pretests and posttests and analyzed using the Shapiro-Wilk normality test, the Paired Sample t-test, and normalized gain (N-Gain). The mean pretest score of 59.50 increased to 82.38 on the posttest. The data were normally distributed, with significance values of 0.077 for the pretest and 0.201 for the posttest. The results of this study indicate that the implementation of Problem-Based Learning supported by the KOMISAT medium can help improve learning outcomes in Pancasila Education among the group of students studied. The implication of this study is that Problem-Based Learning supported by the KOMISAT medium can be considered as an alternative approach to teaching Pancasila Education that integrates problem-solving with comic-based media to help enhance student engagement and learning outcomes.

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1. INTRODUCTION

Pancasila education in elementary school plays a crucial role in shaping civic awareness while instilling an understanding of diversity, responsibility, unity, and social life. The learning process must be designed contextually so that students not only master the concepts theoretically but are also able to understand various situations and adopt attitudes consistent with the values of Pancasila. Based on initial observations at SD N Mangunrekso 02, instruction still tends to be teacher-centered, the use of media is not yet optimal, and the participation of some students in discussions and the expression of opinions remains limited. These conditions highlight the need for instructional media that can present material in a more concrete way while encouraging student engagement during the learning process. Story-based visual media is one such alternative because it effectively combines verbal information and illustrations in a narrative that resonates with children's experiences. Pratiwi et al., (2024) found that elementary school students need more engaging

instructional media than the simple images that are currently used only to a limited extent, and comics are seen as having the potential to increase students' interest in the material. These visual and narrative elements are relevant to Pancasila Education because social concepts and values can be presented through characters, situations, and conflicts that allow students to connect the material to their daily lives. In addition to capturing attention, the use of varied media can help students understand the material and engage in learning activities (Setiani et al., 2024). media in Pancasila education should be viewed not merely as a supplement but as an integral part of learning activities that help students connect the material to more realistic situations.

The use of instructional media is also linked to improved cognitive achievement when the media is used as part of learning activities, rather than merely as a decorative element. Haliza et al., (2024) reported that the use of the "Truth or Dare" game with fourth-grade students resulted in an N-Gain of 0.59—classified as moderate—and supported improvements in cognitive learning outcomes. The use of instructional media can provide students with opportunities to actively engage in thinking, develop knowledge, and solve problems during the learning process. Media that provide activities and interactions for students can help improve learning outcomes; therefore, the selection of media must consider their instructional functions and the level of student engagement they facilitate. In addition to media, problem-based learning provides students with the space to construct knowledge through situations that require investigation and problem-solving. Mufidah et al., (2025) shows that the implementation of Problem-Based Learning can support the development of critical thinking skills among elementary school students through learning that centers on problems as the basis for learning activities. This model provides students with the opportunity to engage in problem-solving, collaborate, communicate, and determine solutions to the problems they face. These characteristics align with the goals of Pancasila Education, which aim for students to understand social issues, evaluate information, and make decisions based on the values they have learned. Sihaloho & Saragih, (2024) identify problem orientation, student organization, investigation, presentation of results, and evaluation as key components in the implementation of Problem-Based Learning. Learning media can provide the context and information sources that students use when engaging in problem-solving activities. Learning media integrated with the model not only helps convey content but also supports student interaction with the problems and tasks at hand (Febrianti et al., 2024). The model structures the flow of learning activities, while media helps present a context that students can observe, read, and use to build understanding. The integration of the two is crucial in Pancasila Education because students need to understand concepts while also applying them to assess and resolve relevant social situations.

One relevant medium is comics. The integration of comics with problem-based learning is also beginning to develop. Comics possess visual and narrative elements that allow learning issues to be presented through characters, storylines, illustrations, and specific situations. In problem-based learning, these characters can be used to present problems concretely while also serving as a source of information that students can revisit. The integration of comics with problem-based learning can support student engagement in understanding problems and developing thinking skills throughout the learning process. (Wahdania et al., 2024). Problem-based comics can also be viewed as a medium that combines visual information with problem-solving activities, so that the medium's function extends beyond the act of reading (Wajdi et al., 2022). In the context of elementary school, the development of comics combined with Problem-Based Learning demonstrates that storylines can be integrated with the learning tasks and activities that students must complete

(Rahayu & Astuti, 2025). These characters are relevant to Pancasila Education because concepts such as diversity, community life, and social attitudes are easier to discuss when students are presented with a shared, observable scenario. In terms of higher-order thinking skills, Maftukhah & Putra (2025) found that Problem-Based Learning aided by comics increased the average critical thinking ability of fourth-grade students from 39.57 to 64.57. Comics are used not only as reading material but also as an instructional medium that supports the stages of Problem-Based Learning.

A more specific study on Pancasila Education also demonstrates the potential for integrating media with Problem-Based Learning. Rizki et al., (2025) reported an increase in the average learning outcomes for fourth-grade Pancasila Education from 48.2 to 77 following the implementation of Problem-Based Learning supported by the CACAPA media. Meanwhile, Sihombing & Aeni (2025) observed an increase in learning outcomes from 53.52 to 88.52, with an N-Gain of 74.91%, through the PBL-based Lectora Inspire 18 media. These studies consistently demonstrate that media integrated with problem-based learning has the potential to improve learning outcomes in Pancasila Education, even though the characteristics of the media, the content, and the types of activities used differ. Other findings in the context of fourth-grade Pancasila Education show a consistent pattern. Cornelia & Waldi (2025) reported an increase in average learning outcomes from 81.65 in Cycle I to 89.75 in Cycle II following the implementation of Problem-Based Learning supported by Canva. Nurhayati et al., (2024) also demonstrated that Problem-Based Learning supported by electronic worksheets on the concept of the Unitary State of the Republic of Indonesia (NKRI) increased the percentage of learning outcomes from 83% in Cycle I to 91% in Cycle II. Both studies indicate that the use of media integrated with problem-based learning can support improved learning outcomes in Pancasila Education. Although the media used differ from KOMISAT which takes the form of a mission-based printed comic and is equipped with an interactive board.

This study introduces KOMISAT (Komik Misi Anak Hebat), a printed comic book that not only presents stories but also integrates "missions" as problem triggers and an interactive board as a tool for group decision-making. The content focuses on the diversity of community identities, attitudes of respect for differences, and village and subdistrict institutions. Unlike comic books that are used solely as reading material, KOMISAT is designed to be an integral part of the process by which students identify problems, discuss information, devise solutions, and engage in reflection. In addition to measuring overall learning outcomes, this study maps improvements in cognitive abilities C1 (remembering), C2 (understanding), C3 (applying), and C4 (analyzing) so that patterns of change in learning outcomes can be observed in greater detail. This study aims to analyze differences in learning outcomes before and after the intervention, as well as the effectiveness of the Problem-Based Learning model supported by the KOMISAT medium on the Pancasila Education learning outcomes of elementary school students.



Figure 1. KOMISAT media design

The KOMISAT media shown in Figure 1 consists of printed comics and interactive boards that are used in an integrated manner throughout the learning process. During the problem-orientation stage, students examine the story panels and illustrations to identify the characters, situations, and issues that spark discussion. During the organization stage, the mission outlined in KOMISAT serves as a guide for the tasks that the group must complete. During the investigation, students reread the story, search for information, find clues, and discuss possible solutions based on the available data. The comic is used again as a reference source when the group formulates reasons and develops solutions, while the interactive board is used to record the group's choices or decisions. In the presentation stage, students explain the results of their discussions and provide reasons for the chosen solution. The final stage involves a joint evaluation to assess the appropriateness of the solution to the problem and its alignment with the values of Pancasila Education that were studied. With this structure, KOMISAT functions not only as reading material but also as an instructional medium that guides student activities from the stage of understanding the problem to evaluating its solution.

2. RESEARCH METHODS

This study employed a quantitative approach using a pre-experimental method and a one-group pretest-posttest design. The research design is illustrated in the following figure:

$$O_1 \quad X \quad O_2$$

Figure 2. *One-Group Pretest-Posttest Design*
Source: Nurhayati et al., (2025)

The study was conducted during the first semester of the 2026/2027 academic year at SD N Mangunrekso 02, Tambakromo Subdistrict, Pati Regency, Central Java. The study sample consisted of all 24 fourth-grade students, comprising 11 boys and 13 girls. The sampling technique used was saturation sampling because the fourth grade was the only

class at the school. The series of activities in this study was carried out over five sessions: one pretest session, three learning sessions using KOMISAT in problem-based learning, and one posttest session. The intervention integrated the KOMISAT medium into the five stages of Problem-Based Learning, namely student orientation to the problem, organization of learning activities, individual and group investigation, development and presentation of results, and analysis and evaluation of the problem-solving process. KOMISAT was integrated into each stage through stories and illustrations to spark the problem, missions to guide group tasks, visual cues to support investigations, and an interactive board as a tool for organizing and presenting group decisions. The primary research instruments were Pancasila education learning outcome tests in the form of pretests and posttests, designed based on learning outcomes and cognitive indicators C1 (remembering), C2 (understanding), C3 (application), and C4 (analysis).

Data analysis was conducted in stages using the Shapiro-Wilk normality test, the paired-sample t-test, and Normalized Gain (N-Gain). The normality test was used to ensure that the distributions of the pretest and posttest scores met the assumptions of parametric analysis, with a significance level of > 0.05. After the data were confirmed to be normally distributed, the paired-sample t-test was used to test for differences in the mean learning outcomes before and after the intervention within the same group. The paired-sample t-test in a one-group pretest-posttest design can be used to compare scores before and after the intervention for the same subjects (Solfiana et al., 2025). Next, N-Gain was used to determine the magnitude of the improvement based on a comparison of pretest and posttest scores following the intervention (Zulfa et al., 2026). The N-Gain value is then categorized as high, moderate, or low, while the N-Gain percentage is used to determine the level of effectiveness: <40% is ineffective, 40–55% is less effective, 56–75% is moderately effective, and >76% is effective (Nurlaelasari & Suryana, 2024). In this study, the N-Gain analysis was conducted on overall learning outcomes and each cognitive indicator from C1 to C4.

3. RESULTS AND DISCUSSION

3.1. Research Results

The research results were obtained by comparing the pretest and posttest scores of 24 fourth-grade students after three learning sessions using the Problem-Based Learning model supported by the KOMISAT media. Pretest scores ranged from 46 to 70 with an average of 59.50, while posttest scores ranged from 73 to 93 with an average of 82.38. All students achieved higher posttest scores than pretest scores, indicating a descriptive improvement in learning outcomes following the intervention. Before testing for differences in means, the data were first analyzed using the Shapiro-Wilk normality test because the sample size was less than 50. The results of the normality test are presented in Table 1.

Table 1. Normality Test Results

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
pretest	.173	24	.062	.926	24	.077
posttest	.163	24	.097	.944	24	.201

a. Lilliefors Significance Correction

Source: SPSS 27, 2026.

Based on Table 1, the Shapiro-Wilk significance value for the pretest was 0.077 and for the posttest was 0.201. Both values were greater than 0.05; therefore, the pretest and posttest data were deemed to be normally distributed. With the assumption of normality met, the analysis continued using a paired-sample t-test to determine whether there was a difference in the mean learning outcomes before and after the treatment within the same group.

Table 2. Results of the Paired-Sample t-Test

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	PRETEST - POSTTEST	-22.87500	5.32682	1.08733	-25.12432	-20.62568	-21.038	23	<,001

Source: SPSS 27, 2026

The results of the paired-sample t-test in Table 2 yielded a t-value (23) of -21.038 with $p < 0.001$. Since the p-value is less than 0.05, there is a significant difference in the mean learning outcomes between the pre- and post-treatment conditions. The pretest-posttest mean difference of -22.875 indicates that the posttest mean is approximately 22.88 points higher; the negative sign results from subtracting the posttest score from the pretest score. After identifying the mean difference, the magnitude of the improvement in learning outcomes was analyzed using N-Gain.

Table 3. N-Gain Test Results

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Ngain_score	24	.29	.77	.5671	.11861
Ngain_Persen	24	29.41	76.67	56.7071	11.86096
Valid N (listwise)	24				

Source: SPSS 27, 2026

Based on Table 3, the N-Gain calculation yielded an average of 0.5671, or 56.71%, with a minimum value of 0.29 and a maximum of 0.77. The average value of 0.5671 falls into the moderate category, while the percentage of 56.71% is interpreted as fairly effective. Thus, based on the criteria used in this study, the media-assisted Problem-Based Learning (PBL) model using KOMISAT demonstrates a level of effectiveness that is "fairly effective" for the group under study. Further analysis was conducted on each cognitive indicator to examine patterns of improvement in learning outcomes in greater detail.

Table 4. N-Gain Results Based on Cognitive Ability Indicators

Indicator	Average Pretest Score	Avarage Posttest Score	N-Gain	Category	interpretation
Remembering (C1)	30,55	54,16	0,34	Medium	Ineffective
Understanding (C2)	72,91	89,93	0,62	Medium	Moderately Effective

Application (C3)	59,25	78,24	0,46	Medium	Less Effective
Analysis (C4)	50,00	88,88	0,77	High	Effective

Source: Data penelitian, 2026.

Based on Table 4, improvements were observed across all cognitive indicators, with varying effectiveness categories and interpretations. Recall ability (C1) achieved an N-Gain of 0.34, or 34%, which falls into the moderate category with an interpretation of "ineffective." Comprehension ability (C2) achieved an N-Gain of 0.62, or 62%, which falls into the moderate category with an interpretation of "fairly effective." Application ability (C3) achieved an N-Gain of 0.46, or 46%, which falls into the moderate category with an interpretation of "less effective." Meanwhile, analysis ability (C4) achieved the highest N-Gain of 0.77, or 77%, which falls into the high category with an interpretation of "effective." These results indicate that the N-Gain categories and the percentage interpretations of effectiveness provide complementary information; the categories describe the level of improvement, while the percentages indicate the level of effectiveness for each indicator. These differences in achievement are further discussed based on the learning activities that took place during the treatment period.

3.2. Discussion

Examining changes in overall learning outcomes after students participated in instruction using the Problem-Based Learning model supported by the KOMISAT media. The average pretest score of 59.50 increased to 82.38 on the posttest, and all 24 students achieved a higher posttest score than their initial score. The results of the Paired Sample t-Test indicate that this difference is statistically significant, while the N-Gain of 0.5671, or 56.71%, places the improvement in the moderate category with a level of effectiveness rated as "fairly effective." This improvement indicates that after the instruction, students were able to achieve higher learning outcomes on the "Understanding the Surrounding Environment" material; however, the interpretation remains limited to the study group because the design did not include a control class. The change in learning outcomes can be attributed to the nature of Problem-Based Learning, which provides students with the opportunity to apply their knowledge when understanding and solving problems, rather than merely receiving information. In Pancasila Education instruction, a problem-oriented approach helps students connect concepts to more concrete social situations so that knowledge can be applied in the thinking and decision-making processes. The nature of problem-based learning as a means to activate the use of knowledge in the context of cognitive learning outcomes is also supported by (Andani et al., 2024). Thus, the improvement observed in this study can be understood as a change in learning outcomes that occurs in tandem with an increase in student engagement in problem-solving activities.

The learning process over the course of three treatment sessions showed that students engaged in a more diverse range of activities than simply listening to the teacher's explanations. During the orientation phase, students examined the KOMISAT story panels to identify the characters, situations, and problems that needed to be solved. Afterward, students worked in groups, using the mission as a guide to determine the necessary information and divide tasks. During the investigation phase, group members reread the story, looked for clues, exchanged opinions, compared information, and discussed possible solutions before making a decision. The process of identifying, analyzing, and solving problems through both individual and group activities is a key characteristic of Problem-Based Learning, which helps students build understanding through direct engagement

(Lestari et al., 2025). When presenting their results, students explain the reasoning behind their chosen solutions, respond to other groups' opinions, and use information from KOMISAT as a reference. In the final stage, students and teachers evaluate the accuracy of the solutions and relate them back to the values of Pancasila Education. This series of activities encourages students not only to read the material but also to observe, discuss, make decisions, present, and reflect on the results of problem-solving.

The KOMISAT platform plays a crucial role in supporting these activities because stories, illustrations, missions, and interactive boards are used continuously from the beginning to the end of the learning process. Stories and illustrations provide a context that can be observed repeatedly, while missions transform the information in the stories into tasks that the group must complete. The interactive board provides a space for students to record their choices and the outcomes of their decisions, making the group's thought process visible and open to discussion. The use of media as part of learning activities can support student engagement in the learning process because the media is used in conjunction with the Problem-Based Learning approach to help students understand the tasks and solve the problems presented (Saifuddin et al., 2024). In the context of Pancasila education, the use of comics combined with Problem-Based Learning can also provide a visual context that helps students understand issues and apply information during the problem-solving process (Setyoningsih & Puspita, 2024). These functions are realized through the use of comic panels as a source of information, missions as guides for activities, and interactive boards as tools for decision-making. KOMISAT media are not used as visual embellishments, but as part of the instructional process that helps students engage with the material and problems during learning.

The first indicator, recall ability (C1), achieved an N-Gain of 0.34, or 34%, which falls into the moderate category with an interpretation of "ineffective." These results indicate that recall ability continued to improve after instruction, but the magnitude of the improvement has not yet reached a higher level of effectiveness based on the N-Gain percentage interpretation. During learning activities, recall ability is used when students recognize terms, characters, forms of diversity, and information found in stories or missions. The presentation of information through texts and illustrations that can be reviewed provides students with the opportunity to recognize and recall the material during discussions or when answering questions. The learning process was not designed to focus on repetition or rote memorization, as most activities were directed toward problem understanding and solution-finding. The use of interactive learning media can support student engagement in the learning process while also aiding the development of their cognitive abilities (Khairunnisa et al., 2025). The "moderate" category in C1 indicates an improvement in recall ability, while the 34% figure—interpreted as "ineffective"—suggests that the improvement in this indicator remains limited compared to other indicators more frequently used in the discussion and analysis process.

The second indicator, comprehension (C2), achieved an N-Gain of 0.62, or 62%, which falls into the "moderate" category and is interpreted as "fairly effective." This result indicates that comprehension showed a stronger improvement than recall and has reached a level of "fairly effective" effectiveness. During the learning process, students not only recognized information but also interpreted situations within the story, explained the information in their own words, and connected the illustrations to the concepts of Pancasila Education being studied. Group discussions provide students with the opportunity to compare their understanding with their peers' opinions and refine their explanations when differences arise. The application of media-assisted Problem-Based Learning in Pancasila Education can support student engagement in the problem-solving process while also

helping to achieve learning outcomes (Khusna et al., 2025). The visual narrative in KOMISAT helps maintain the connection between concepts and situations so that the information learned does not exist as isolated definitions. Therefore, the 62% N-Gain—which is interpreted as quite effective—can be linked to activities such as reading context, interpreting information, discussing, and restating the material during mission completion.

The third indicator, the ability to apply (C3)—achieved an N-Gain of 0.46, or 46%, which falls into the moderate category and is interpreted as less effective. The ability to apply is demonstrated when students must apply concepts or values they have understood to determine actions appropriate to the situation within the mission. Students do not merely state concepts; they must select answers, provide reasons, and post the group's decision on the interactive whiteboard. This activity provides students with the opportunity to transfer knowledge from abstract concepts to more contextual situations. A media-assisted Problem-Based Learning model in Pancasila education can support students in applying the knowledge they have learned through problem-solving activities and more active learning experiences (Rohmah et al., 2025). Although there was an improvement in the moderate category, the 46% rate indicates that effectiveness in C3 is still considered less effective. This suggests that the ability to apply concepts still requires practice in more diverse and repeated situations. The three treatment sessions provided an initial opportunity for application, but were not sufficient to determine how consistently students transfer concepts to broader contexts.

The fourth indicator, analytical skills (C4), achieved an N-Gain of 0.77, or 77%, which falls into the "high" category with an "effective" interpretation, making it the most outstanding achievement among all indicators. Analytical skills are used repeatedly as students break down problems, sort through relevant information, compare options, connect information, and determine justifiable solutions. When there are differences of opinion within the group, students need to review the information in KOMISAT and explain the reasons supporting the group's choice. During the presentation and evaluation stages, students also reassess the suitability of the solution to the problem and the values of Pancasila Education that were applied. The implementation of media-assisted Problem-Based Learning provides students with opportunities to develop critical thinking skills through activities such as understanding problems, evaluating information, and determining solutions (Putri et al., 2025). Group problem-solving activities, formulating answers, and presenting results can also encourage students to use their critical thinking skills during the learning process (Setyawan et al., 2023). The N-Gain score of 77%, which is interpreted as effective, aligns with the most dominant activities during learning: identifying, comparing, evaluating, and analyzing information before making a decision.

Overall, the patterns of improvement from C1 to C4 indicate that all cognitive abilities underwent changes after the learning process, but the categories of improvement and their levels of effectiveness varied. C1 achieved an N-Gain of 0.34, or 34%, falling into the moderate category and interpreted as ineffective; C2 achieved 0.62, or 62%, falling into the moderate category and interpreted as moderately effective; C3 achieved 0.46, or 46%, falling into the moderate category and interpreted as less effective; while C4 achieved 0.77, or 77%, falling into the high category and interpreted as effective. These differences indicate that the KOMISAT-assisted Problem-Based Learning model provides varying levels of support for each cognitive demand. Learning activities provide students with more opportunities to apply their knowledge in understanding and analyzing problems rather than merely recalling information or applying concepts to a wide variety of situations. KOMISAT supports this process through a storyline as the context of the problem, a mission as a guide for group activities, visual cues as a source of information, and an interactive

board as a tool for making decisions. Although the overall average N-Gain of 56.71% indicates a fairly effective level of effectiveness, the research results must be interpreted in accordance with the One-Group Pretest-Posttest design, which involved only one class without a control group. Furthermore, the main intervention took place over three sessions, so the time students had to adapt to the media and learning patterns was relatively limited. The research results show a significant difference and an improvement in learning outcomes in the study group; however, these findings should not be used to claim that the KOMISAT-assisted Problem-Based Learning model is absolutely superior to all other learning alternatives.

4. CONCLUSION

Based on the research findings, the Problem-Based Learning model supported by the KOMISAT media was quite effective in improving the Pancasila Education learning outcomes of fourth-grade students at SD N Mangunrekso 02. This was demonstrated by an increase in the average score from 59.50 on the pretest to 82.38 on the posttest, as well as the results of the Paired Sample t-Test, which indicated a significant difference. The average N-Gain of 0.5671, or 56.71%, falls into the moderate category with a level of effectiveness rated as "fairly effective," with the highest improvement observed in analytical skills (C4). These findings imply that the KOMISAT media can serve as an alternative learning tool to support the implementation of Problem-Based Learning in Pancasila Education instruction. Future research is recommended to include a control group, a longer treatment period, and a larger sample size to obtain stronger evidence of effectiveness.

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