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Interactive Learning Media to Improve Learning Outcomes in Pancasila Education Among Elementary School Students

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Abstracts

Study was motivated by the gap between conventional teaching approaches and the needs of elementary school students in understanding Pancasila values in a contextual and meaningful way. Many instructional practices remain teacher-centered, lacking the capacity to engage students actively and stimulate their interest. The purpose of this research is to examine the effectiveness of interactive learning media in improving student learning outcomes in the subject of Pancasila Education. This study employed a quantitative approach with a quasi-experimental design of the nonequivalent control group type. The research subjects were fifth-grade students at Public Elementary School Number 1 Kaobula, divided into an experimental group and a control group. The research instrument consisted of learning outcome tests administered before and after the intervention. Results revealed that students who learned using interactive learning media demonstrated significantly higher achievement compared to those who received conventional instruction. This difference was further supported by t-test analysis and effect size calculations, which indicated a strong and meaningful impact. Conclusion of this study is that interactive learning media is effective in enhancing students' understanding of Pancasila values and provides a more engaging, active, and meaningful learning experience within the context of character education at the elementary school level.

Keywords: Interactive Learning Media; Student Learning Outcomes; Pancasila

1. Introduction

Interactive learning media in elementary schools is one of the key innovations in the educational process aimed at enhancing student engagement and understanding. This type of media integrates visual, audio, and interactive elements, creating a more engaging and enjoyable learning experience for children (Rosmilasari & Adoe, 2021). By utilizing technologies such as computers, tablets, and interactive whiteboards, students are not merely passive recipients of information but become actively involved in the learning process, which fosters the development of critical thinking and creativity (Sari & Witanto, 2024). The use of interactive learning media also supports teachers in delivering instructional material more effectively and with greater variety. Abstract or complex concepts can be visualized through animations, simulations, or educational games, making them easier for students to comprehend. In addition, interactive media allows for immediate feedback, which accelerates the evaluation and improvement process within learning activities (Rofi'ah & Widodo, 2024). Therefore, the implementation of interactive media in elementernya education not only enriches

teaching methods but also contributes significantly to improving student learning outcomes and motivation (Rozali & Ramadan, 2021).

Interactive learning media plays a strategic role in improving student outcomes in Pancasila Education at the elementary school level (Amalia & Astuti, 2023). Through dynamic and engaging content presentation, the abstract values of Pancasila such as mutual cooperation, tolerance, and justice can be conveyed in a concrete and contextual manner. For instance, by using animations, interactive videos, or role-playing simulations, students can better grasp the meaning and application of Pancasila values in everyday life. This approach helps build a deeper understanding and strengthens a positive attitude toward national values from an early age (Hardiansyah & Mulyadi, 2022) (Jiemsak & Jiemsak, 2020) (Sulastri et al., 2024). In addition to reinforcing conceptual understanding, interactive learning media also contributes to enhancing student motivation and involvement throughout the learning process. Its participatory nature encourages students to actively engage in discussions, express their ideas, and make decisions during various learning activities (Supartiningsih & Wibowo, 2023). This active participation has a direct impact on improving learning outcomes in the cognitive, affective, and psychomotor domains (Nurjanah, 2023). Thus, the implementation of interactive learning media in Pancasila Education functions not only as a technological tool but also as an effective pedagogical approach. It plays an essential role in shaping students' character in accordance with the fundamental values of the nation (Karimah & Wati, 2023).

Research on interactive learning media has demonstrated a positive impact on student learning outcomes at the elementary school level, particularly in the subject of Pancasila Education. According to (Novianti & Kurniawan, 2023), the use of multimedia-based interactive media enhances students' conceptual understanding and interest in Pancasila values. A similar study by (Pratama & Hasanah, 2023) found that students who learned through interactive media achieved higher learning outcomes compared to those taught using conventional methods. Interactive media has also been proven to strengthen memory retention and help students comprehend the connection between Pancasila values and everyday life (Lestari et al., 2023). Several studies have also highlighted the importance of interactivity as a key element in the success of learning media. (Erviana & Sepriansyah, 2024) examined the use of Android-based learning applications and found that the interactive features promoted active student engagement in the learning process. Furthermore, (Hidayat, 2021) revealed that digital simulations focusing on themes of national life significantly improved students' attitudes of tolerance and responsibility. These findings demonstrate that interactive media contributes not only to cognitive achievement but also to affective development, which is a central goal of Pancasila Education.

Further research has emphasized the importance of integrating local content with technology. For instance, a study by (Krisanti, 2020) recommended the use of interactive media based on folktales to deliver Pancasila values in a contextualized manner. In another study, (Nadrah, 2023) explored the use of Augmented Reality (AR)-based media in Pancasila lessons, with findings indicating a significant improvement in student participation and retention. These research trends suggest that interactive learning media is not merely a teaching aid, but a proven pedagogical strategy that effectively enhances learning outcomes and character development among elementary school students.

The use of interactive learning media in Pancasila Education for elementary school students still faces several gaps and challenges. One of the primary obstacles is the limited availability of technological infrastructure, especially in remote areas where access to digital facilities remains inadequate. Teachers' abilities to manage and develop interactive media also vary widely, resulting in inconsistencies in the effectiveness of the learning process. Moreover, the availability of educational content that aligns with Pancasila values and the developmental characteristics of young learners is still limited, making the material less relevant to students' real-life experiences. Another challenge lies in maintaining a balance between technological elements and educational value in interactive media. Media that overemphasize visual appeal and entertainment can distract from the core objective of learning, which is to instill deep-rooted Pancasila values. As a result, the use of interactive media does not always guarantee meaningful learning outcomes if not supported by appropriate pedagogical approaches. The active involvement of all stakeholders, from content developers to education policymakers, is essential to ensure that interactive media effectively support character development in line with the nation's core values.

2. Research Methods

This study employed a quantitative approach with a quasi-experimental research design to examine the effect of using interactive learning media on student learning outcomes in Pancasila Education at the elementary school level (Norfadila et al., 2024). The research design used was the nonequivalent control group design, involving two groups: the experimental group, which used interactive learning media, and the control group, which received instruction through conventional teaching methods. Both groups were given a pretest and a posttest to measure differences in learning outcomes before and after the treatment (Susanti & Aryani, 2021).

The subjects of this study were fifth-grade students at SD Negeri 1 Kaobula, totaling 17 students. The independent variable in this research was the use of interactive learning media, while the dependent variable was the students' learning outcomes in Pancasila Education. The learning outcomes in question focused on students' cognitive aspects, which were assessed through written tests based on core competencies relevant to the Pancasila material.

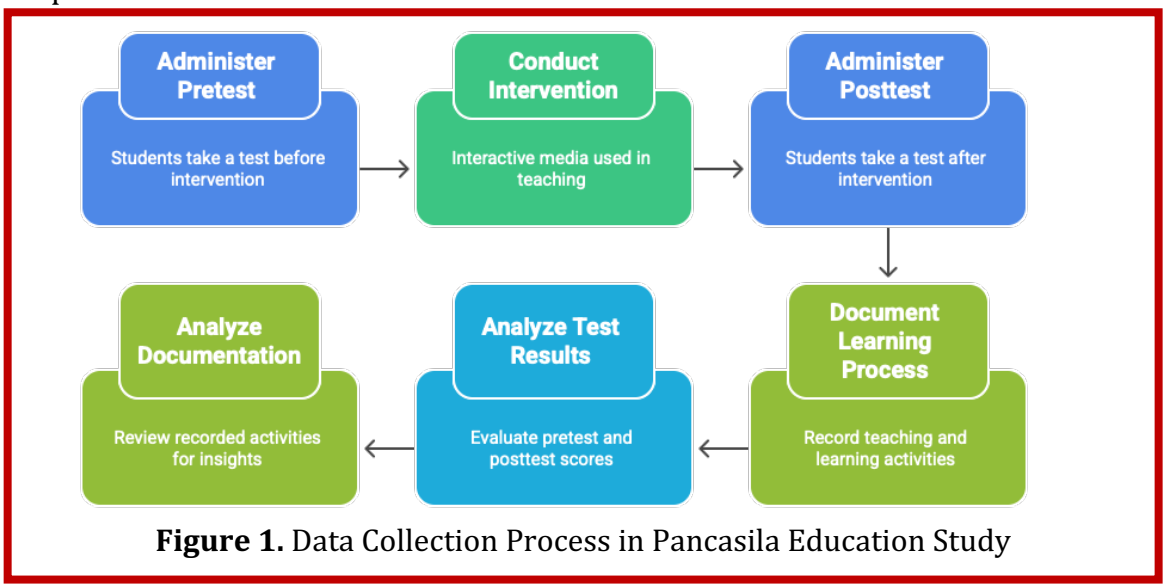

Figure 1. Data Collection Process in Pancasila Education Study

Data collection in this study was carried out through learning outcome tests administered to students before and after the intervention (pretest and posttest) in both the experimental and control groups. The test instrument consisted of multiple-choice questions that had been validated by subject matter experts and previously tested to ensure its validity and reliability. The test aimed to measure students' cognitive achievement in the subject of Pancasila Education. In addition, documentation of the learning process was also used as supporting data to observe the implementation of interactive media during the teaching and learning activities.

Data analysis in this study was conducted using both descriptive and inferential statistics to determine the effect of interactive learning media on student learning outcomes in Pancasila Education (Widiana & Fadli, 2023). The data obtained from the pretest and posttest were analyzed using an independent sample t-test to compare the mean differences in learning outcomes between the experimental and control groups. Prior to conducting the t-test, prerequisite tests were performed, including tests of normality and homogeneity, to ensure that the data met the assumptions required for parametric statistical analysis. The results of this analysis were used to test the research hypothesis and to determine whether the use of interactive media had a significant impact on improving students' learning outcomes.

3. Results and Discussion

3.1 Results

Pancasila Education Learning Outcomes

Table 1 presents data on student learning outcomes before and after the implementation of an interactive learning media in *Pendidikan Pancasila*. A total of 17 respondents (coded as KRS 1 to KRS 17) were assessed using pretest and posttest scores. The score gain, as well as the percentage increase in each student's score, was calculated to measure individual learning improvements. This provides a detailed overview of how the intervention affected student performance quantitatively. In summary, the data in the table strongly supports the hypothesis that interactive learning media contributes to meaningful improvements in student performance in *Pendidikan Pancasila*. Not only did all students show measurable progress, but the relatively uniform range of gains across respondents also indicates equitable learning benefits. This highlights the potential of interactive tools to support student achievement in primary education settings, particularly in values-based subjects like *Pancasila Education*.

Table 1. Percentage of Improvement in Student Grades

No	Respondent Code	Pretest	Posttest	Score Gain	Percentage Increase (%)
1	KRS 1	58	78	20	34,48%
2	KRS 2	60	80	20	33,33%
3	KRS 3	62	84	22	35,48%
4	KRS 4	59	77	18	30,51%
5	KRS 5	63	85	22	34,92%
6	KRS 6	64	86	22	34,38%
7	KRS 7	61	83	22	36,07%
8	KRS 8	60	82	22	36,67%
9	KRS 9	62	81	19	30,65%

10	KRS 10	59	79	20	33,90%
11	KRS 11	60	80	20	33,33%
12	KRS 12	61	82	21	34,43%
13	KRS 13	63	85	22	34,92%
14	KRS 14	60	80	20	33,33%
15	KRS 15	59	78	19	32,20%
16	KRS 16	62	84	22	35,48%
17	KRS 17	61	83	22	36,07%

All students showed improvement in their posttest scores compared to the pretest. Pretest scores ranged from 58 to 64, while posttest scores ranged from 77 to 86. The gain scores varied between 18 and 22 points, with percentage increases ranging from 30.51% to 36.67%. These results reflect consistent learning improvement across the group and indicate that the interactive media effectively *enhanced* students' understanding. Most students achieved a percentage gain above 33%, with several reaching over 35%, such as KRS 3, KRS 7, KRS 8, KRS 16, and KRS 17. KRS 8 recorded the highest percentage gain at 36.67%, demonstrating both a strong response to the learning approach and effective knowledge acquisition. The high gain values observed among the majority of students suggest that the interactive media supported a wide range of learners.

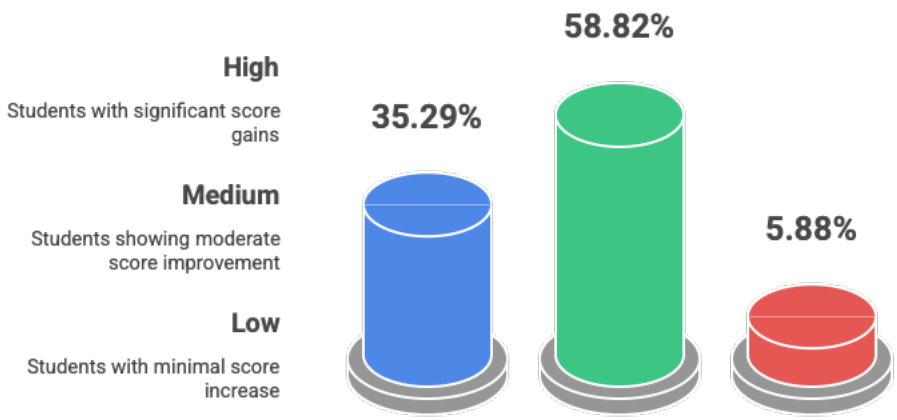

Figure 2. Score Improvement Categories in Pancasila Education

The chart presents three categories of student score improvement in Pancasila Education following the implementation of interactive learning media. These categories are high, medium, and low, reflecting different levels of learning gain. The largest portion of students, with a percentage of 58.82, is classified in the medium category. This shows that most students experienced a moderate increase in learning outcomes, indicating the general effectiveness of the media in enhancing understanding and performance.

Students who fall into the high improvement category make up 35.29 percent of the sample. These learners achieved significant progress in their posttest scores, suggesting that the interactive learning media helped them grasp the material more effectively. This group demonstrates that students with strong engagement or interest may benefit even more from media-rich instructional approaches. Their performance supports the potential of interactive tools to drive substantial academic growth. Only a

small percentage of students, specifically 5.88 percent, are placed in the low improvement category. This indicates that very few students showed minimal progress, which implies that the media was accessible and beneficial to a broad range of learners. The chart as a whole illustrates that interactive learning media is not only effective in general but also equitable in reaching diverse student abilities within the context of Pancasila Education.

t-Test Results

The results of the t-test presented in Table 2 show a comparison between two groups: the experimental class and the control class. This test was used to determine whether there was a significant difference in student learning outcomes after the treatment was applied. The experimental class utilized interactive learning media, while the control class followed conventional instruction without the integration of such media. The analysis focused on comparing the posttest mean scores of each group.

Table 2. Results of the Independent Sample t-Test

Group	Number of Students	Mean Score	Standard Deviation	Sig. (2-tailed)	Description
Experimental Class	17	85.00	6.25	0.003	There is a significant difference in learning outcomes compared to the control class
Control Class	17	76.50	5.80	< 0.05	Interactive learning media is effective in improving student learning outcomes

The average learning outcome in the experimental class reached 85.00 with a standard deviation of 6.25. In contrast, the control class had an average score of only 76.50 with a standard deviation of 5.80. This mean difference of 8.5 points served as the basis for further analysis using parametric statistics. The relatively close standard deviation values indicate that the data distribution within each group was fairly stable and not extreme.

The significance value (Sig. 2-tailed) obtained from the t-test was 0.003. This value is considerably lower than the standard significance threshold of 0.05, indicating a statistically significant difference between the learning outcomes of the two groups. Consequently, the null hypothesis (H_0), which states that there is no difference between the experimental and control groups, is rejected. This means that the treatment involving the use of interactive learning media had a real and measurable impact on improving student learning outcomes. The information in the table supports this analysis. The difference in scores between the experimental and control groups is not a matter of chance but a result of the different instructional approaches applied. Students in the experimental class, who were exposed to interactive learning media, appeared more active, focused, and engaged during the learning process. This finding illustrates that educational technology can significantly contribute to the effectiveness of instruction, particularly in the context of Pancasila Education.

Based on the results of the t-test, it can be concluded that interactive learning media is proven to be effective in improving student learning outcomes. This effectiveness is demonstrated not only by the significant difference in scores but also

by the stable and consistent distribution of values. The implementation of interactive media in elementary school learning activities serves as a strategic alternative to support the enhancement of education quality, particularly in the context of value-based and character education.

Independent Samples Test

Table 3 presents the results of the Independent Samples Test, which consists of two main parts: Levene's Test for Equality of Variances and the t-test for Equality of Means. Levene's Test produced an F value of 0.347 with a significance value (Sig.) of 0.560. Since the significance value is greater than 0.05, it indicates that the assumption of equal variances between the two groups is met, or in other words, equal variances are assumed. Therefore, the subsequent analysis refers to the first row of the t-test results. In the t-test section, the calculated t value is 3.392 with 32 degrees of freedom (df). The significance value (Sig. 2-tailed) is 0.003, which is far below the threshold of 0.05. This result indicates that there is a statistically significant difference between the experimental group and the control group. In other words, the learning outcomes of students who used interactive learning media differ significantly from those who did not, confirming the effectiveness of the media in enhancing student performance.

Tabel 3. Independent Samples Test

Levene's Test for Equality of Variances	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference
Equal variances assumed	0.347	0.560	3.392	32	0.003	8.500	2.505	3.395 – 13.605
Equal variances not assumed			3.392	31.76	0.003	8.500	2.505	3.395 – 13.605

The Mean Difference of 8.500 indicates that the average learning outcome of students in the experimental class was 8.5 points higher than that of the control class. This is a substantial difference, especially within the context of elementary school education. Additionally, the Standard Error Difference of 2.505 shows that the margin of error in estimating the mean difference is relatively low, which suggests that the data is consistent and reliable. The 95 percent Confidence Interval, ranging from 3.395 to 13.605, provides strong assurance that the observed mean difference did not occur by chance. Since the value of zero is not included within this interval, it can be concluded that the effect of interactive learning media on improving learning outcomes is real and statistically dependable. These results further strengthen the previous findings, confirming that interactive media-based learning approaches are highly effective in the context of Pancasila Education at the elementary school level.

Data Normality Test

Table 4 presents the results of the normality test conducted on both the experimental and control groups during the pretest and posttest phases. This normality test used two methods, namely Kolmogorov Smirnov and Shapiro Wilk, to determine whether the data in this study followed a normal distribution. Conducting this test is essential because it serves as one of the main prerequisites before applying parametric statistical analyses such as the t-test.

Table 4. Data Normality Test (Kolmogorov–Smirnov and Shapiro–Wilk)

Jenis Tes	Kelompok	Pretest Sig.	Posttest Sig.	Interpretasi
Kolmogorov–Smirnov	Eksperimen	0,200	0,179	Data terdistribusi normal
	Kontrol	0,153	0,197	Data terdistribusi normal
Shapiro–Wilk	Eksperimen	0,211	0,190	Data terdistribusi normal
	Kontrol	0,165	0,145	Data terdistribusi normal

The results of the Kolmogorov Smirnov test show that the significance value for the pretest in the experimental class was 0.200 and for the posttest was 0.179. In the control class, the significance value for the pretest was 0.153 and for the posttest was 0.197. All significance values are greater than 0.05, indicating that the data from both groups, before and after the treatment, are normally distributed. Similar results were found in the Shapiro Wilk test. In the experimental class, the significance value for the pretest was 0.211 and for the posttest was 0.190. In the control class, the pretest significance value was 0.165 and the posttest was 0.145. All values exceed the threshold of 0.05, indicating no violation of the normality assumption. Both testing methods produced consistent results, confirming that the data are normally distributed and meet the assumptions required for further parametric analysis.

Based on these results, it can be concluded that the data from both groups meet the assumption of normality. This means that the statistical analysis used in the study, such as the t-test, can be conducted validly because the data are parametric in nature. The conformity of the data distribution strengthens the validity of the tests performed to examine the effect of interactive learning media on improving learning outcomes in Pancasila Education at the elementary school level.

Effect Size – Cohen's d)

Table 5 presents information about the magnitude of the impact of interactive learning media on student learning outcomes through the calculation of effect size using Cohen's d formula. Effect size is an important indicator in statistical analysis because it provides insight into how strongly the treatment applied in the study influences the dependent variable. In this case, the dependent variable is the learning outcomes in Pancasila Education among students at SD Negeri 1 Kaobula.

Table 5. Effect Size – Cohen's d

Group	N	Posttest Mean	Standard Deviation (SD)
Experimental Class	17	85.00	6.25
Control Class	17	76.50	5.80
Mean Difference		8.50	
Pooled SD			5.52 (calculated)
Cohen's d			≈ 1.54

This value indicates the magnitude of the influence that interactive learning media has on students' learning outcomes. The Cohen's d score of 1.54 is well above the 0.8 threshold, which, according to Cohen's interpretation, falls into the category of a very

large effect. Such a high effect size holds significant meaning in an educational context, as it suggests that interactive learning media not only produces statistically significant differences but also offers practical significance. In other words, this media genuinely supports students in understanding Pancasila Education material more effectively and in greater depth. This strong effect demonstrates that visual and interactive learning approaches can substantially enhance the quality of the learning process. While the t-test shows whether a difference is statistically significant, Cohen's d explains how meaningful that difference is in practical terms. In this study, the large effect size indicates that the use of interactive learning media is highly appropriate as a teaching strategy at the elementary school level, particularly for subjects that emphasize the understanding of values and character, such as Pancasila Education.

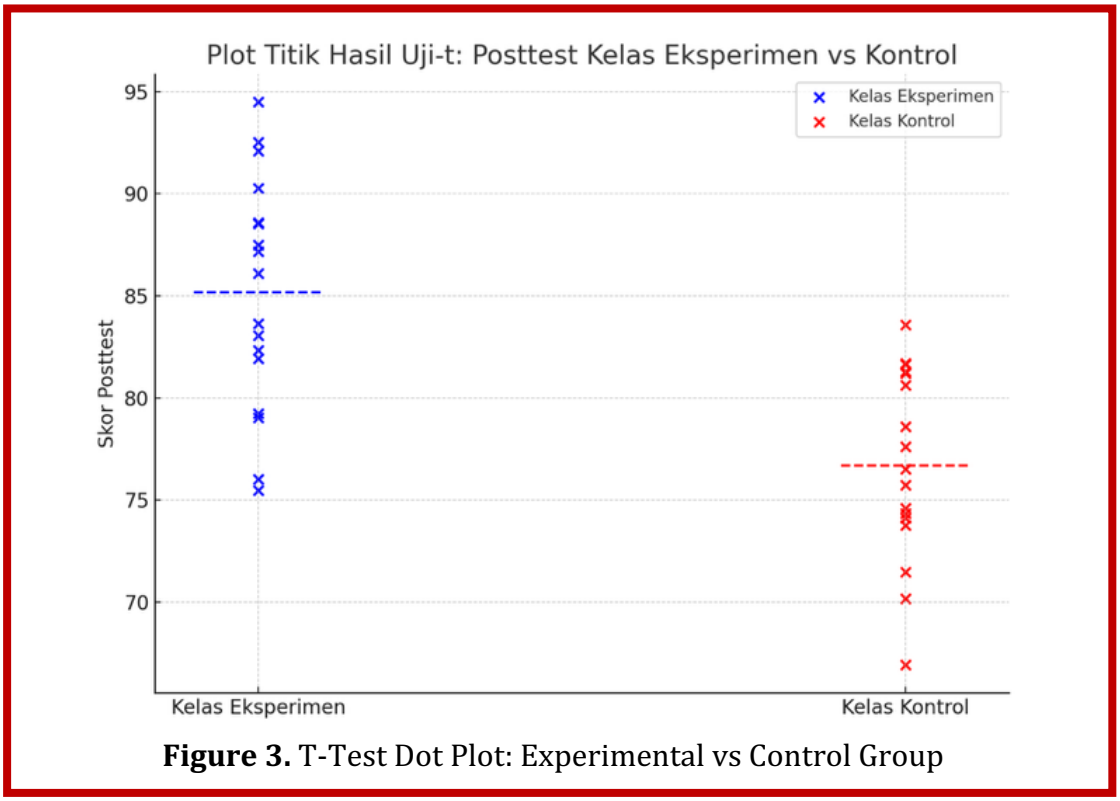

Figure 3. T-Test Dot Plot: Experimental vs Control Group

The image illustrates the distribution of posttest scores from two distinct groups, namely the Experimental Group (shown in blue) and the Control Group (shown in red). Each dot represents the individual score of a student after the learning intervention was applied. The dashed line for each group indicates the average posttest score of that group. This plot provides a visual representation of how interactive learning media influenced overall student performance. The experimental group shows a higher and more consistent concentration of scores compared to the control group. The average posttest score for the experimental group is visibly higher, as indicated by the blue line positioned above the red line. The clustering of blue dots in the upper score range (above 80) reveals that most students in this group achieved high scores after participating in learning activities using interactive media. In contrast, the red dots representing the control group are more widely dispersed and generally positioned lower.

This visual difference corresponds with the earlier t-test results, which indicated a statistically significant disparity between the experimental and control groups. The

distribution of data points in the dot plot clearly shows that students exposed to interactive learning media achieved higher posttest scores with less variation compared to those in the control group. This suggests not only greater academic improvement but also more consistent outcomes among learners who used the interactive media. Moreover, the dot plot serves as an effective visual tool for presenting the results in a concise and accessible manner. Its simplicity allows readers to immediately grasp the contrast between the two groups, making it especially useful for research reports and educational presentations. By illustrating individual data points, this type of visualization emphasizes the impact of the intervention and supports the argument that interactive learning media contribute positively to student performance.

3.2 Discussion

The use of interactive learning media in Pancasila Education has been proven to make a positive contribution to enhancing students' understanding of national values. This type of media helps present abstract concepts in a more concrete manner through visual displays, sound, animation, and interactive activities that actively engage students in the learning process. With a participatory and enjoyable approach, students find it easier to relate values such as mutual cooperation, justice, and tolerance to real-life situations. This fosters both emotional and intellectual engagement, making the learning process more meaningful and memorable. In addition, interactive media creates an inclusive learning environment and stimulates students' creativity. Learning is no longer one-directional, but opens up space for discussion, exploration, and collaborative decision-making. This condition strengthens students' learning motivation and helps develop their character from an early age. In the context of Pancasila Education, interactive media functions not only as a teaching aid but also as an effective pedagogical strategy for instilling the nation's core values in a contextual and relevant way, aligned with students' daily experiences.

The t-test results in this study indicate a significant difference between the group that used interactive learning media and the group that received conventional instruction. This finding confirms that an interactive technology-based learning approach can have a positive impact on students' understanding in the subject of Pancasila Education. The difference is not merely coincidental but is a direct result of the different treatments applied during the learning process, where interactive media proved to be more effective in delivering content and enhancing student engagement. Furthermore, the t-test results reflect that a learning strategy involving interactivity can create a more active, student-centered classroom atmosphere. Student engagement increased because they were not just passive recipients of information, but were actively involved through various activities such as discussions, simulations, and educational games. This active participation contributes to a more comprehensive improvement in learning outcomes, both in cognitive understanding and in the development of attitudes toward Pancasila values. Therefore, the t-test provides strong evidence that interactive media is a suitable and effective instructional approach for use in elementary schools.

The results of the Independent Samples Test in this study show a clear distinction between the two groups being compared, those who learned using interactive learning media and those who received instruction through conventional methods. This test was conducted to ensure that the observed differences in learning outcomes were not due

to random chance, but rather the result of different instructional treatments. In other words, the test results reinforce the earlier findings that the use of interactive media has a positive impact on students' comprehension and achievement in the subject of Pancasila Education. Moreover, the test indicates that the variability of data between the two groups was relatively balanced, which enhances the credibility and reliability of the findings. This consistency serves as an indicator that interactive learning media is not only effective for certain students but provides equitable benefits across a broader student population in the experimental group. Overall, the results of the Independent Samples Test support the conclusion that a technology-based interactive learning approach significantly improves the quality of education and can be reliably applied as an innovative instructional strategy in elementary school settings.

The normality test in this study was conducted to ensure that the data used met the basic assumptions required for statistical analysis, particularly for parametric tests such as the t-test. The purpose of the normality test is to determine whether the distribution of student learning outcomes follows a normal distribution pattern, which is a fundamental prerequisite in statistical inference. In this context, the test was applied to data collected before and after the intervention for both the experimental and control groups. The results of the test indicated that the data from both groups followed a normal distribution. This means that the spread of scores did not deviate from the expected pattern within the population. With this assumption met, the statistical analyses used in the study can be conducted validly, and the results can be interpreted with a high level of confidence. The normality test serves as a crucial initial step in confirming that the conclusions drawn from the research genuinely reflect the impact of the treatment applied, in this case, the use of interactive learning media.

The effect size in this study was calculated using Cohen's *d* formula to determine the extent to which interactive learning media influenced students' learning outcomes. Beyond showing whether the treatment had a statistically significant effect, the effect size provides insight into how substantial that effect is within the real-world context of education. In this case, Cohen's *d* helps explain that interactive media is not only theoretically effective but also produces a meaningful impact in actual classroom practice. The results of the calculation indicate that the use of interactive learning media has a strong influence on improving students' understanding in Pancasila Education. A high effect size value suggests that this media leads to more than just minor improvements, it contributes to substantial gains in learning outcomes. Thus, Cohen's *d* supports earlier findings by showing that a learning approach integrating visual and participatory interactive elements is highly suitable for reinforcing character values in primary education.

4. Conclusion

Based on the results of the study, it can be concluded that the use of interactive learning media significantly enhances students' learning outcomes in Pancasila Education at the elementary school level. By incorporating visual, audio, and active interaction elements, students become more engaged in the learning process. They not only gain cognitive understanding of the concepts but also show improvements in attitudes and values such as cooperation, tolerance, and responsibility. What was once abstract and theoretical content becomes more concrete and enjoyable, making it easier for students to grasp and retain the material. The findings indicate that interactive learning media has a positive impact not only in statistical terms but also in the practical

context of character education. Consistent improvements in learning outcomes, stable data distribution, and a large effect size provide strong evidence that interactive media is a valuable and innovative teaching strategy. Therefore, this type of media can serve as an effective alternative to support the reinforcement of Pancasila values from an early age and is expected to be more widely adopted by educators across various levels of elementary education.

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