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The Influence of Peer Group Interaction on the IPAS Learning Outcomes of Elementary School Students

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Abstract

The purpose of this study is to determine whether there is an influence between peer interaction (Peer Group) and the results of students' science learning at SDN Pakis I Surabaya. This research method is, this research is a quantitative study that uses the ex post facto method, namely research used to find the causes of changes in behavior, symptoms or phenomena that occur and data collection using questionnaires on 5th grade students of SDN Pakis I Surabaya. The data processing will be done using SPSS 26. Conclusion: The results shiwed that peer interaction did not significantly outcomes (t = -0.628, p = 0.532). the regression model was also not statistically significant (F =0.394, p = 0.532), with an R^2 VALUE OF 0.004, indicating that peer interaction explained only 0.4% of the variance in students IPAS learning outcomes. Therefore, it can be concluded that peer group interaction does not significantly influence the science learning outcomes of SDN Pakis students. Other factors can contribute to high and low learning outcomes, including parenting styles, socio-cultural conditions, or cultural factors.

Keywords Peer Group, Science Learning Outcomes, Elementary School, IPAS.

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INTRODUCTION

Student learning outcomes in Natural and Social Sciences (IPAS) at the primary school level in Indonesia remain a focal point in efforts to improve the quality of education. Under the Kurikulum Merdeka (Independent Curriculum), IPAS instruction emphasizes not only conceptual mastery but also students' critical thinking, collaboration, communication, and social interaction skills (Badan Standar, Kurikulum, 2024). Consequently, the success of IPAS learning is influenced not merely by individual aptitude but also by the quality of social relationships within the school environment—specifically, interactions between students and their peers. Results from the Programme for International Student Assessment (PISA) indicate that the scientific literacy of Indonesian students remains below the OECD average and lags behind high-performing nations such as Singapore and Japan (OECD, 2023). These findings suggest that enhancing the quality of science education remains a priority within Indonesia's education system. However, PISA results do not directly reflect the specific state of IPAS learning outcomes at individual educational institutions. To gain a more specific understanding of the issues at the school level, empirical data regarding student learning outcomes at the research site are required. This study focuses on IPAS learning outcomes, examining them in the context of the actual conditions experienced by fifth-grade students at SDN Pakis I Surabaya.

Conditions in the field reflect similar issues. Interviews with a fifth-grade teacher at SDN Pakis I Surabaya revealed that, in the Natural and Social Sciences (IPAS) subject during the odd semester, 50 out of 90 students—approximately 55%—failed to meet the Learning Objective Achievement Criteria (KKTP) established by the school. The teacher attributed these varying IPAS learning outcomes to the diverse behaviors students exhibited during the learning process. Students who actively paid attention to the teacher's explanations and participated in the lesson tended to achieve high grades. Conversely, students who were passive, disengaged from learning activities, and frequently disrupted the class—creating an unconducive environment—often achieved suboptimal learning outcomes. Some students also struggled to build positive relationships with their peers due to behaviors perceived as disruptive, such as being mischievous, lazy, or uncooperative in class (Aulia et al., 2023).

The peer group environment is a social factor that significantly influences the development of primary school-aged children. Every student maintains close relationships with their peers. Desmita (2021) states that children aged 7 to 11 spend a significant portion of their time interacting

with peers; consequently, these interactions shape a child's behavioral, emotional, and academic development. Through such interactions, children not only gain social support and self-confidence but also hone their communication and cooperation skills (Saidi, 2021). Conversely, unsupportive peer relationships can trigger adjustment issues and diminish learning motivation, thereby hindering students' academic achievement. In this regard, Santrock (2022) argues that positive peer interactions can enhance students' academic performance. Establishing healthy and positive peer relationships should be cultivated early on within the school environment (Fadhila & Mukhlis, 2023).

The relationship between peer group interactions and student learning outcomes has been a focal point of various studies. Research by Marta et al. (2022) found that peer group interactions positively influence student learning outcomes. This finding is reinforced by Rukayah et al. (2022), who revealed that higher-quality peer interactions lead to more optimal academic achievement for students. Furthermore, Setiawan et al. (2024) explained that peer group interaction dynamics contribute positively to student motivation and learning outcomes. However, Agustiningtyas and Surjanti (2021) presented contrasting results, suggesting that the peer group does not have a significant direct influence on improving student learning outcomes, as other factors—such as learning motivation—play a role. This aligns with the view of Cahyani et al. (2024) that the effectiveness of peer groups as a learning resource depends heavily on the quality of relationships within the students' immediate environment. These differing findings indicate that the influence of peer groups on learning outcomes can vary based on factors such as the quality of interpersonal relationships, student characteristics, school environmental conditions, and the specific subjects being studied.

In general, prior research has largely focused on the influence of peer groups on student motivation and learning outcomes at the junior and senior high school levels. Existing findings regarding the impact of peer groups on learning outcomes have also been inconsistent; some studies indicate that peer group interactions significantly affect student learning achievements, whereas others suggest that such interactions have no impact. Research specifically examining the influence of peer group interactions on IPAS (Natural and Social Sciences) learning at the elementary school level remains limited and scarce. Consequently, this situation highlights a research gap concerning how peer group interactions influence IPAS learning outcomes among elementary school students. Addressing this gap, this study aims to analyze the influence of peer group interaction on the IPAS

(Natural and Social Sciences) learning outcomes of fifth-grade students at SDN Pakis I Surabaya. Theoretically, the study is expected to contribute to the literature regarding the role of social interaction at the elementary school level; practically, the findings can serve as a reference for teachers and school administrators when designing learning activities that foster positive social interaction to enhance student learning outcomes.

METHOD

This study employs a quantitative approach utilizing an *ex post facto* correlational design—a non-experimental correlational design. This design is used to analyze the statistical relationship and influence of peer group interaction (the independent variable) on IPAS (Natural and Social Sciences) learning outcomes (the dependent variable) without administering any treatment or manipulating the research variables. Peer group interaction was observed based on conditions naturally occurring among the students, and the relationship with IPAS learning outcomes was subsequently analyzed using simple linear regression (Sugiyono, 2024). The study was conducted during the 2024/2025 academic year at SDN Pakis I Surabaya; this location was selected due to empirical issues regarding the IPAS learning outcomes of fifth-grade students. Preliminary information obtained from the fifth-grade teacher indicated that some students had not yet met the Learning Objective Achievement Criteria (KKTP) established by the school. Furthermore, there were variations in student behavior during the learning process, including differences in engagement and interaction with peers. These conditions made SDN Pakis I Surabaya a relevant setting for examining the influence of peer group interaction on students' IPAS learning outcomes. The study population comprised all fifth-grade students across three classes—V-A, V-B, and V-C—totaling 90 students.

Tabel 1. Distribution of the Research Population

Class	Number of Students
V-A	30
V-B	30
V-C	30
Total	**90**

Sampling was conducted using the purposive sampling technique, wherein the sample was selected based on specific criteria relevant to the research objectives (Larasati, 2024). These criteria included shared respondent characteristics: fifth-grade students who received IPAS instruction

using the same curriculum and materials, fell within a relatively similar age range, and experienced similar learning environments. Additionally, this technique was employed to optimize time and costs while facilitating data access. Based on these criteria, the entire population of 90 students from classes 5A, 5B, and 5C was designated as the research sample.

Research data were collected via a questionnaire administered to students to measure their level of peer group interaction, while data on student learning outcomes in IPAS (Natural and Social Sciences) were obtained from odd-semester summative assessment scores. The questionnaire utilized a five-point Likert scale (Strongly Agree, Agree, Undecided, Disagree, and Strongly Disagree) and comprised 20 statements. These items were developed based on peer group interaction indicators identified by Andri (2023), covering: (1) social interaction within the peer group, (2) individual engagement in interaction, (3) peer support, and (4) peers as study partners. Prior to the main study, the questionnaire underwent a pilot test with fifth-grade students at SDN Dukuh Kupang I. This pilot test was conducted to assess the instrument's validity and reliability using IBM SPSS Statistics 26 for Windows software. Analysis results confirmed that the instrument met the criteria for validity and reliability.

The research procedure was conducted in four stages. The first stage involved developing the instrument based on variable indicators. The second stage consisted of piloting the instrument and analyzing its validity and reliability. The third stage involved data collection through the distribution of questionnaires and the gathering of summative IPAS (Natural and Social Sciences) scores from the odd semester. The fourth and final stage entailed data processing and analysis. Data analysis began with a descriptive analysis to provide an overview of peer group interaction levels and student learning outcomes. Subsequently, prerequisite tests—specifically normality and linearity tests—were performed prior to hypothesis testing. Hypothesis testing utilized simple linear regression analysis to measure the extent of the influence of peer group interaction on IPAS learning outcomes.

FINDINGS AND DISCUSSION

Findings

This study involved 90 fifth-grade students at SDN Pakis I Surabaya. The research data comprised two variables: peer group interaction as the independent variable and IPAS (Natural and Social Sciences) learning outcomes as the dependent variable. Data on peer group interaction were obtained via a questionnaire consisting of 20 statements, while data on IPAS learning outcomes were

derived from odd-semester summative assessment scores. Data description was used to provide an overview of the characteristics of each variable, including the number of data points (N), minimum value, maximum value, mean, and standard deviation.

Tabel 2. Research Data

Variabel	N	Minimum	Maksimum	Mean	Std. Deviation
Science Learning Results	90	25	37	29,75	3,226
Peer Interaction (Peer Group)	90	34	45	40,30	3,435

All statement items in the peer group interaction instrument were found to be valid based on validity test results using IBM SPSS Statistics 26. The significance values for each item ranged from 0.000 to 0.048; thus, all items met the validity criteria, as their significance values were below 0.05. Consequently, the 20 statement items are suitable for use as a research instrument.

Tabel 3. Instrument validity test results

No.	Number of item	Sig. Value	Remarks
1	Item 1	0,002	Valid
2	Item 2	0,000	Valid
3	Item 3	0,000	Valid
4	Item 4	0,009	Valid
5	Item 5	0,000	Valid
6	Item 6	0,000	Valid
7	Item 7	0,048	Valid
8	Item 8	0,033	Valid
9	Item 9	0,002	Valid
10	Item 10	0,000	Valid
11	Item 11	0,000	Valid
12	Item 12	0,000	Valid
13	Item 13	0,000	Valid
14	Item 14	0,029	Valid
15	Item 15	0,000	Valid
16	Item 16	0,023	Valid
17	Item 17	0,000	Valid
18	Item 18	0,039	Valid
19	Item 19	0,019	Valid
20	Item 20	0,000	Valid

The reliability test results indicate that the peer interaction instrument has a Cronbach's Alpha value of 0.703. This value exceeds the minimum threshold of 0.70; therefore, the instrument demonstrates a good level of reliability and is suitable for use in the study.

Tabel 4. Reliability test results

Reliability Statistics

Cronbach's Alpha	N of Items
,703	20

A normality test was conducted on the regression residuals using the One-Sample Kolmogorov–Smirnov Test. The test results yielded a Sig. (2-tailed) value of 0.198, which is greater than 0.05. Thus, the data residuals are normally distributed, thereby satisfying the prerequisites for simple linear regression analysis.

Tabel 5. Normality Test Results

One-Sample Kolmogorov-Smirnov Test			
			Unstandardized Residual
N			90
Normal Parameters[a,b]	Mean		,0000000
	Std. Deviation		12,57746763
Most Extreme Differences	Absolute		,111
	Positive		,047
	Negative		-,111
Test Statistic			,111
Asymp. Sig. (2-tailed)			,008[c]
Monte Carlo Sig. (2-tailed)	Sig.		,198[d]
	99% Confidence Interval	Lower Bound	,187
		Upper Bound	,208
a. Test distribution is Normal.			
b. Calculated from data.			
c. Lilliefors Significance Correction.			
d. Based on 10000 sampled tables with starting seed 2000000.			

The results of simple linear regression analysis show that F-value of 0.721 was obtained with a significance value of 0.489. Since the significance value of 0.489 is greater than 0.05, it can be concluded that there is no significant difference in learning outcomes among the analyzed groups.

Thus, the differences in mean learning outcomes across the groups do not indicate a statistically significant difference.

Tabel 6. Linearity test results

ANOVA Table	Sum of Squares	df	Mean Square	F	Sig.
Peer Interaction IPAS Learning Outcomes – Between Groups (Combined)	8.967,2	2	54,201	0,721	0,489
Linearity	243,2	1	243,294	5,297	0,039
Deviation from Linearity	623,9	15	41,595	0,906	0,386
Within Groups	4.455	71	45,929		
Total	`4.528	89			

The model summary shows an R value of 0.067, indicating a very weak relationship between peer group interaction and IPAS learning outcomes. The R-square value of 0.004 means that peer group interaction accounts for only 0.4% of the variation in IPAS learning outcomes, while 99.6% is influenced by factors outside the research model.

Tabel 7. Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0,067	0,004	-0,007	12,649

Based on the ANOVA test results, an F-value of 0.394 was obtained with a significance level of 0.532. Since the significance value of 0.532 is greater than 0.05, the regression model is deemed non-significant. This means that the peer group interaction variable does not significantly predict IPAS learning outcomes.

Tabel 8. Anova Test Results

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	63,040	1	63,040	0,394	0,532
Residual	14079,860	88	159,998		
Total	14142,900	89			

The regression coefficient test results indicate that peer group interaction has a value of -0.119, with a t-value of -0.628 and a significance level of 0.532. Since the significance value exceeds 0.05, peer group interaction does not have a significant effect on the IPAS learning outcomes of fifth-grade students at SDN Pakis I Surabaya.

Tabel 9. Regression coefficient test results

Variabel	B	Std. Error	Beta	t	Sig.
(Constant)	98,158	18,882		5,199	0,000
Peer Group	-0,119	0,189	-0,067	-0,628	0,532

The research results indicate that peer group interaction does not significantly affect the IPAS learning outcomes of fifth-grade students at SDN Pakis I Surabaya. Thus, H_0 is accepted and H_1 is rejected.

Discussion

The findings of this study indicate that peer group interaction does not significantly influence students' learning outcomes in IPAS (Natural and Social Sciences). Regression analysis yielded a t-value of -0.628 ($p=0.532 > 0.05$) and a coefficient of determination (R^2) of 0.004. These values indicate that the contribution of peer group interaction to the variation in IPAS learning outcomes is merely 0.4%, while the remaining 99.6% is determined by variables not examined in this study's model. The results demonstrate that the intensity of student interaction with peers is not automatically a determinant of the level of student learning outcomes. The lack of significant influence is likely attributable to the fact that such interactions are not always oriented toward academic activities.

Based on observations at school, it is known that interactions between students are active. Although some of them are filled with discussion of material, exchanging opinions and helping each other, the interactions that occur are also dominated by informal conversations, playing and joking around. This condition shows that the intensity of peer group interaction does not necessarily reflect the quality of academic support that students receive. Interactions that focus on learning activities have the potential to improve learning outcomes, while social interactions outside the academic context tend not to provide a direct contribution to achieving science learning outcomes.

These results can also be linked to the peer group interaction regression coefficient of -0.119. Descriptively, the negative sign indicates a tendency toward an inverse relationship between peer group interaction and learning outcomes; however, this relationship was not found to be statistically significant. Consequently, this negative coefficient cannot be interpreted to mean that peer group interaction actually lowers students' learning outcomes. These findings suggest that the nature of the relationship involving peer group interaction can vary depending on the context of the interaction. If peer group interactions are directed toward supporting discussion and collaborative understanding of the material, they can yield academic benefits. Conversely, if peer group

interactions are dominated by non-academic activities, the intensity of such interactions will not have a significant impact on students' learning outcomes in IPAS (Natural and Social Sciences).

These findings differ from the results of the study by Marta et al. (2022), which noted that peer group interactions had a positive effect on student learning outcomes. This discrepancy indicates that the impact of peer group interactions varies depending on the research context; conversely, the present study found no significant effect. This difference is thought to stem from the quality and nature of interactions in the respective research settings. Interactions tend to have a positive impact when they focus on academic support, such as mutual assistance and the exchange of information regarding coursework. However, field observations revealed that student interactions in this study were not entirely oriented toward academic activities.

A discrepancy in results is also evident when compared to the findings of Rukayah et al. (2022), who stated that higher-quality peer group interactions lead to more optimal student learning achievement. Mere physical interaction proves insufficient to boost academic performance; the more decisive factors lie in the quality of the relationships and the nature of the activities undertaken within them. Findings by Setiawan et al. (2024) further clarify that peer dynamics only make a tangible contribution when they succeed in stimulating student learning motivation. Given the very low R^2 value (0.4%) recorded in this study, it is possible that the relationship between peer interaction and learning outcomes is not direct but is mediated by variables such as motivation, ultimately influencing student grades.

The results of this study align with the findings of Agustiningtyas and Surjanti (2021), indicating that peers' role does not have a significant direct effect on student learning outcomes due to other variables, such as learning motivation. This evidence reinforces the fact that peer group interactions are not the sole determinant of academic achievement. An R^2 value of 0.004 indicates that most of the variation in student learning outcomes is attributable to other internal and external factors not included in this research model. The divergence in results from those of Marta et al. (2022), Rukayah et al. (2022), and Setiawan et al. (2024)—combined with the consistency found with Agustiningtyas and Surjanti (2021)—further strengthens the argument that the influence of peer groups on learning outcomes remains inconsistent. This variation is heavily influenced by student characteristics, the quality of relationships, school environmental conditions, and the nature of interactions.

Overall, this study futher confirms that peer group interaction is not a primary factor in

explaining the IPAS learning outcomes of V grade students at SDN Pakis I Surabaya. This finding does not imply that peer interaction is insignificant; rather, it indicates that such interaction needs to be directed toward activities that support students' academic performance—such as group discussions, helping peers understand the material, and collaborative task completion. This implication aligns with the study's objective of providing insights to help teachers design instruction based on positive social interaction, thereby fostering student learning outcomes.

CONCLUSION

In general, student learning outcomes are influenced by two categories of factors: internal and external. Internal factors include health, intelligence, aptitude, interest, motivation, and study habits, while external factors encompass the family and school environments. There is no significant influence of peer group interaction on the IPAS (Natural and Social Sciences) learning outcomes of fifth-grade students at SDN Pakis I Surabaya. This is evidenced by simple regression analysis results yielding a significance value of 0.532 (greater than 0.05). This indicates that factors other than the variable studied likely play a more substantial role in influencing IPAS learning outcomes, such as the utilization of learning resources, the school environment, and school culture. Furthermore, other factors affecting learning outcomes include learning motivation, teacher competence, teacher communication, study discipline, classroom management, organizational climate, and self-management (Andri Yandi et al., 2023). Additionally, according to Dedi Saputra et al. (2025), student learning outcomes are influenced by various factors, including: (1) positive internal factors such as learning motivation, interest in the subject matter, and physical and mental readiness; (2) positive external factors, including parental support, a conducive school environment, teaching quality, and the availability of learning facilities; (3) negative internal factors, such as low motivation, lack of study discipline, emotional disturbances, and academic stress; and (4) negative external factors, such as an unsupportive family environment, limited economic conditions, and an unhealthy social environment.

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