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The Influence of Active Class Discussions on Students' Understanding of Material in Class 2024G, Surabaya State University

Mifta Sherlyna Ayuningtyas[1], Novia Yonatri Muliyana[2], Niken Roqhilia Amru[3], Reva Rahma Zhauqi[4]
[1,2,3,4]State University of Surabaya, Indonesia

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ABSTRACT

Objective: *This study investigates the impact of student activeness in classroom discussions on their understanding of learning materials.* ***Method:*** *A quantitative correlational approach was employed, involving 40 students from Universitas Negeri Surabaya. Data were collected through observation sheets to measure activeness in discussions and comprehension tests to assess understanding of the material.* ***Results:*** *The analysis, using simple linear regression, revealed a significant positive relationship between student participation in classroom discussions and their material comprehension. Active participants demonstrated a higher level of understanding.* ***Novelty:*** *The research contributes to the ongoing discourse on effective teaching strategies, highlighting the importance of fostering student engagement in discussions as a means to improve learning outcomes. The study emphasizes that passive participation in discussions may hinder comprehension, providing insights for educators seeking to enhance classroom dynamics and academic performance.*

INTRODUCTION

Education emphasizes not only theoretical mastery but also the active participation of students in the learning process. One form of engagement that can improve the quality of learning is classroom discussions. Through discussions, students and teachers can exchange ideas, clarify understanding, and deepen mastery of the material. However, in practice, many students are still passive, resulting in learning activities that tend to be one-way, resulting in poor understanding of the material [1].

The level of student participation in discussions reflects their involvement in the learning process. Based on constructivist theory, understanding will be more optimal if students actively construct their knowledge through interaction and learning experiences. Therefore, classroom discussions play a crucial role in fostering critical thinking skills and deepening conceptual mastery [2].

Understanding of subject matter is a key indicator of learning success, which can be enhanced through active participation in discussions. Students who participate actively tend to ask more questions, provide responses, and connect new information with prior knowledge. These activities help develop analytical thinking skills and strengthen understanding of the learning material [3].

Based on this description, this study aims to determine the extent to which student active participation in classroom discussions influences material comprehension. The results of this research are expected to contribute to educators in designing learning strategies that foster active interaction and improve students' overall understanding.

RESEARCH METHOD

This study used a quantitative approach with a correlational approach, aiming to determine the level of relationship and influence between the variables of classroom discussion activity (X) and material understanding (Y).

The study population was students at Surabaya State University, while the sample size of 40 students was determined using a purposive sampling technique, considering their involvement in the discussion-based learning process [4], [5], [6].

The research instruments included:

1. Discussion activity observation sheets, used to assess the extent to which students participated in discussion activities based on indicators of attendance, speaking frequency, and relevance of responses.
2. Material comprehension tests, used to measure the extent to which students understood the learning material after the discussion.

The collected data were analyzed using simple linear regression analysis using statistical software. Prerequisite tests included normality and linearity tests, while hypothesis testing used F-tests and t-tests at a significance level of 0.05 to determine the influence between the two variables.

RESULTS AND DISCUSSION

Results

The descriptive analysis results showed that the level of student discussion engagement was in the good category, with an average score of 42.00, a minimum score of 38, a maximum score of 47, and a standard deviation of 3.735. Meanwhile, the material understanding variable had an average score of 66.50, with a range of scores between 51–76 and a standard deviation of 6.259. This indicates that the majority of students demonstrated adequate engagement in the discussion and adequate understanding of the material.

Validity and Reliability Test

The validity test showed that all statement items had a calculated r value > r table (0.312), thus being declared valid. The reliability value, using Cronbach's Alpha, of 0.988, indicates that the instrument has a very high level of reliability and is suitable for consistent use in further research.

Normality, Homogeneity, and Linearity Test

The normality test yielded a significance value of 0.200 > 0.05, indicating that the data were normally distributed. The homogeneity test showed a significance value of 0.006 < 0.05, indicating that the data were not homogeneous. However, this difference was tolerable for parametric analysis. The linearity test results showed a linear relationship between discussion engagement and material understanding, with a linearity value of 0.019 < 0.05 and a deviation from linearity of 0.097 > 0.05.

Regression Test and t-Test

The regression test results showed a correlation coefficient (R) of 0.471 and a coefficient of determination (R^2) of 0.222, indicating that discussion engagement had a

22.2% influence on student understanding of the material. The remaining 77.8% was influenced by variables outside this study. The t-test significance value of 0.000 < 0.05 indicated a significant influence between the two variables.

These findings reinforce the view that students who actively participate in discussions tend to have a deeper understanding of the material. Discussion activities not only train speaking skills but also foster reasoning, courage, and the ability to think reflectively about the concepts being learned.

Results Sub-Chapter

1. Descriptive Test

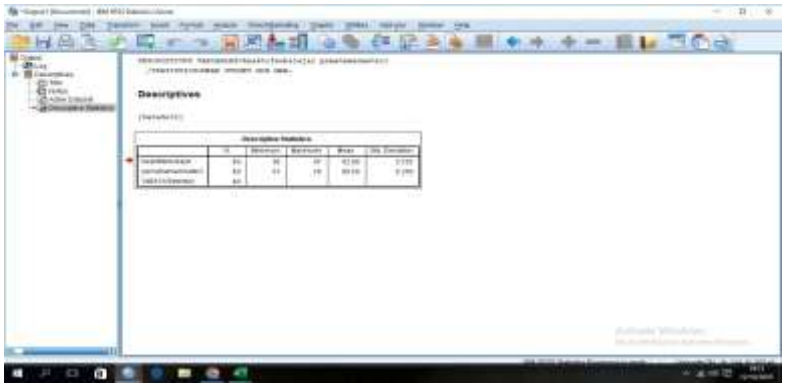

Figure 1. Descriptive test results in SPSS.

For the Material Understanding variable, the average score was 66.50, with a minimum score of 51 and a maximum score of 76. The standard deviation of 6.259 indicates greater variation in the level of material understanding among respondents. However, the high average score indicates that, in general, respondents' understanding of the material is considered good.

2. Validity Testing

Validity testing aims to ensure that the research instrument is truly capable of measuring what it is supposed to measure, so that the data obtained reflect the actual situation or concept. Validity testing is crucial for ensuring high levels of accuracy and precision in research results, allowing scientifically sound conclusions. With guaranteed validity, the instrument can be relied upon to produce results consistent with the measurement objectives, avoid errors in data interpretation, and provide a solid foundation for analyzing and generalizing research findings.

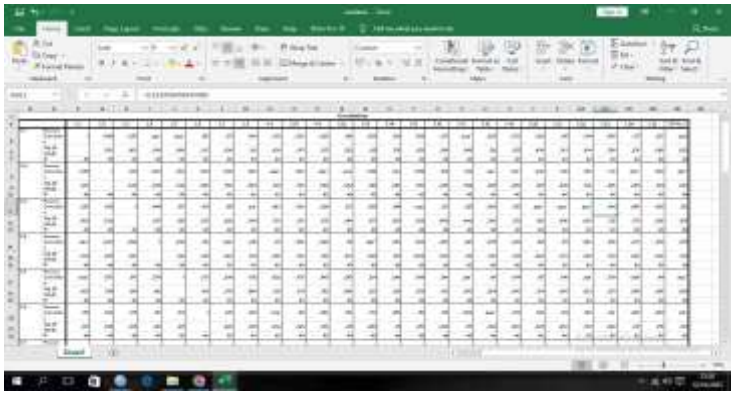

Figure 2. Results of the validity test of variable X in SPSS

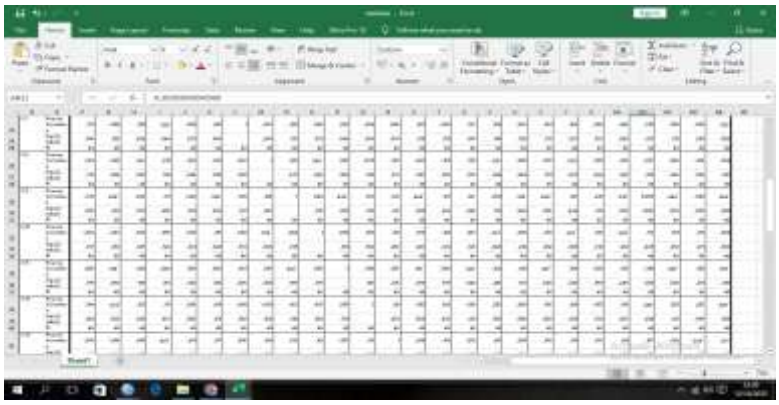

Figure 3. Results of the validity test of variable X in SPSS

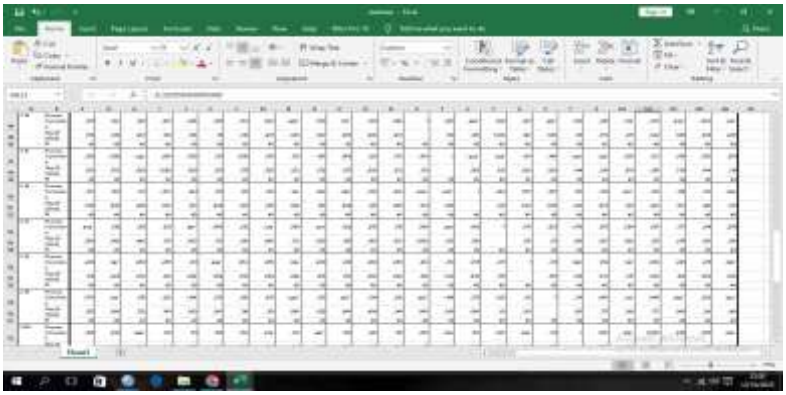

Figure 4. Results of the validity test of variable X in SPSS

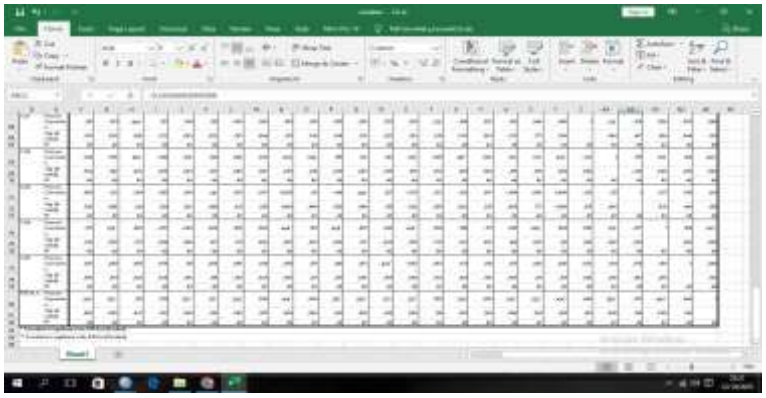

Figure 5. Results of the validity test of variable X in SPSS

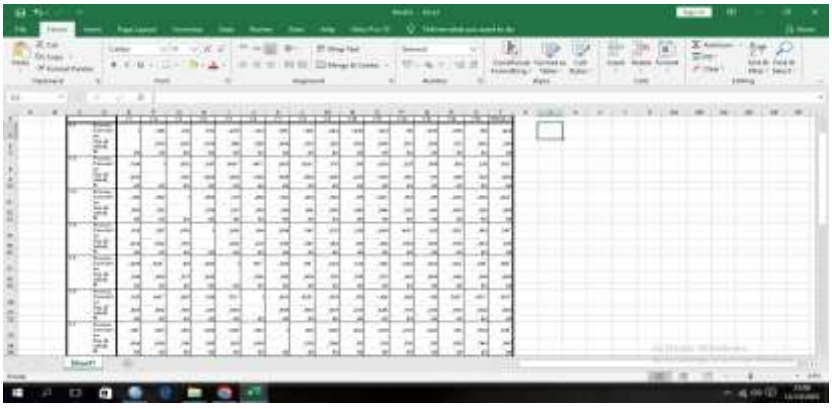

Figure 6. Results of the validity test of variable Y in SPSS

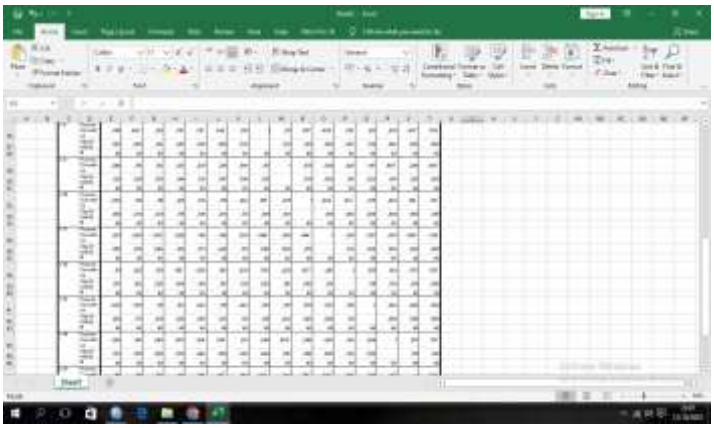

Figure 7. Results of the validity test of variable Y in SPSS

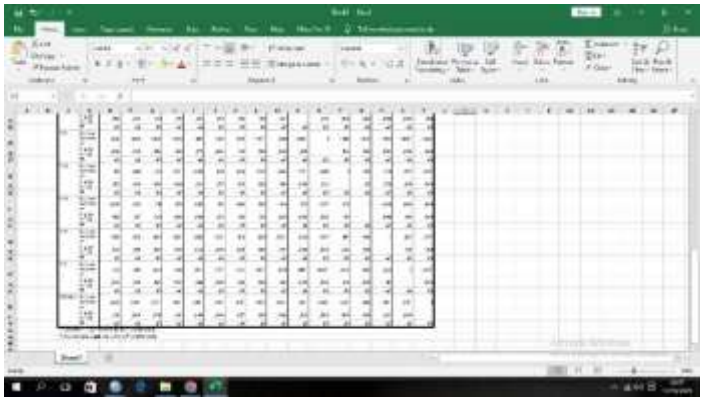

Figure 8. Results of the validity test of variable Y in SPSS

Based on the validity test results, most of the statement items in variables X and Y showed correlation values (calculated r) greater than the table r (0.312) at a significance level of 0.05, thus being declared valid and can be used in research. For variable X, most of the 25 statements met the validity criteria with a significant correlation value with the total score, while variable Y, consisting of 15 statements, also showed valid results. Thus, both research tools as a whole can be used for the next phase of analysis.

3. Reliability Test

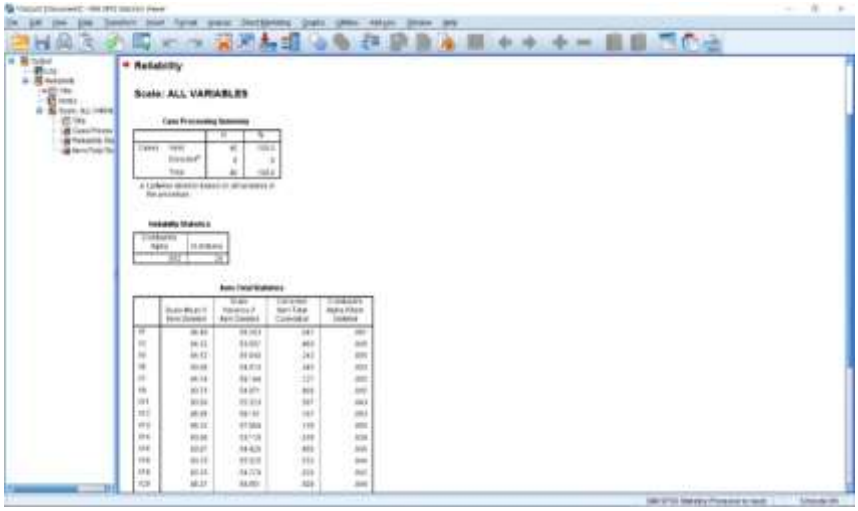

Figure 9. Reliability test results in SPSS

The instrument's reliability analysis using Cronbach's Alpha yielded a value of 0.852, indicating high internal consistency. All item correlations with the total score (Corrected Item-Total Correlation) were positive, indicating no problematic items. Furthermore, the Cronbach's Alpha for Item Deletion value for each item was lower than the overall α value, indicating no items needed to be deleted to improve reliability.

4. Normality Test

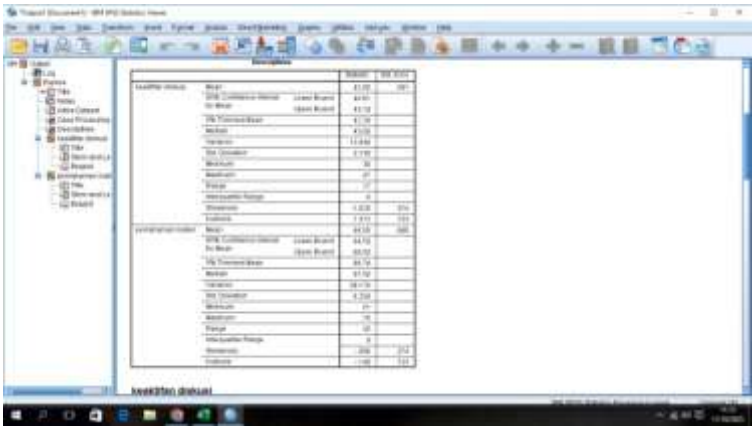

Figure 10. Normality test results in SPSS

The normality test aimed to determine whether the data for the discussion activity and material understanding variables were normally distributed. The test used the Kolmogorov-Smirnov and Shapiro-Wilk methods in IBM SPSS Statistics. The analysis results showed a significance value of 0.200 for each variable, which is greater than 0.05. Thus, both variables were declared normally distributed and met the basic assumptions of parametric analysis for subsequent hypothesis testing.

5. Homogeneity test

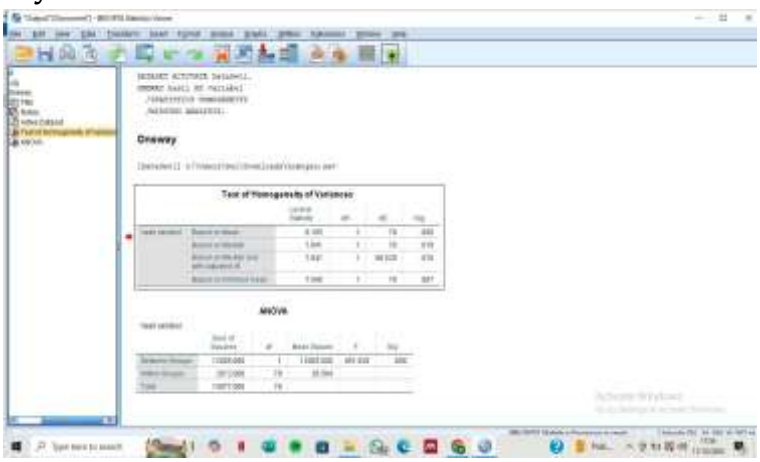

Figure 11. Results of the homogeneity test in SPSS

The homogeneity test was conducted to determine the similarity of variance between data groups in the research variables. Based on the results of the Levene's test using IBM SPSS Statistics, a significance value of 0.006 was obtained. Because this value is less than 0.05 (Sig. < 0.05), it can be concluded that the data is not homogeneous, or there are differences in variance between groups.

6. Linearity test

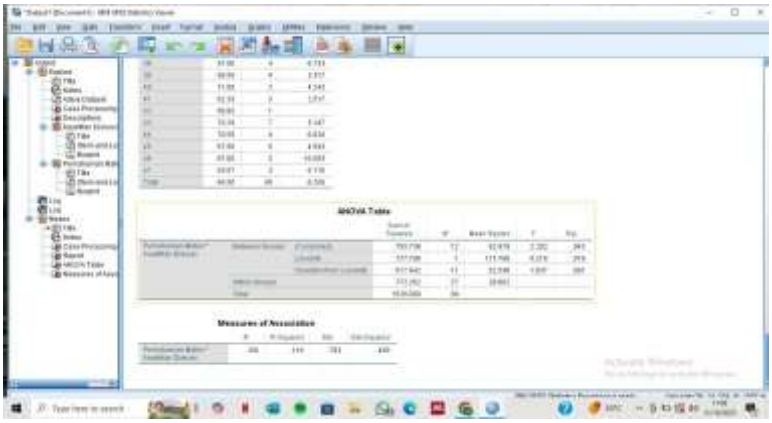

Figure 12. Linearity test results in SPSS

Based on the output obtained in the figure above, the significance value for the linearity component is 0.019, while the significance value for the deviation from linearity component is 0.097.

7. F Test (ANOVA)

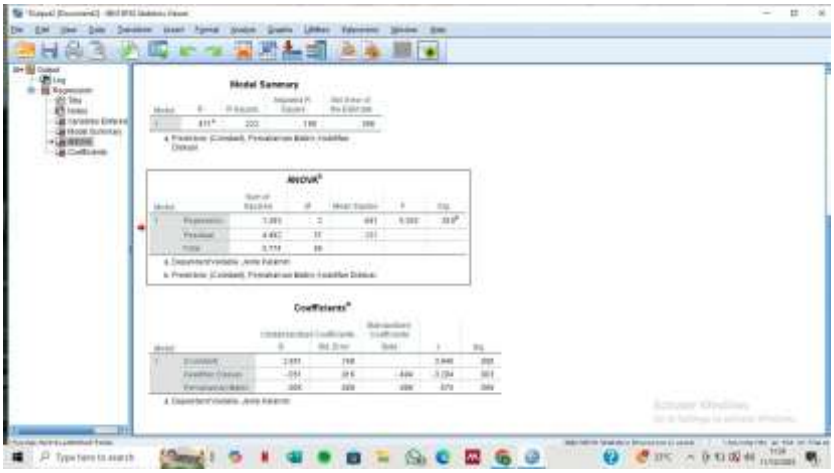

Figure 13. F-test results (ANOVA) in SPSS

Based on the SPSS output, the correlation coefficient (R) is 0.471, and the coefficient of determination (R Square) is 0.222.

8. T-test in SPSS

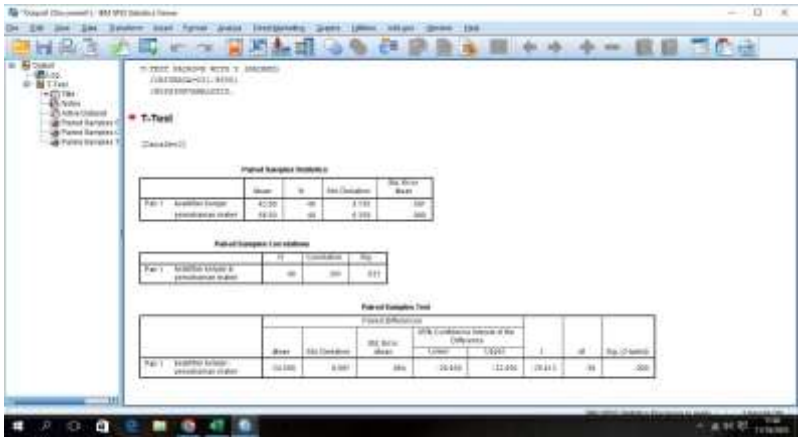

Figure 14. T-Test Results in SPSS

Based on analysis using the Paired Samples T-Test, the average discussion engagement was 42.00 and the material understanding was 66.50. The correlation between the two was 0.341 with a significance level of 0.031, indicating a significant positive relationship. The t-test revealed a mean difference of -24.500 with a t-value of -25.412 and p-value of 0.000.

Discussion

The results of this study align with active learning theory, which emphasizes the importance of student involvement in the learning process. Active involvement through discussions allows students to develop communication, critical thinking, and problem-solving skills. Furthermore, interactions between students during discussions serve as feedback that enriches conceptual understanding [7], [8].

Although active discussion only contributed 22.2% to material comprehension, these results still demonstrate that discussion plays a significant role in the learning process. Other factors influencing comprehension, such as learning motivation, basic skills, and the lecturer's teaching methods, also need to be considered. Therefore, the application of discussion methods should be combined with other learning strategies that can stimulate more comprehensive student participation and reflection [9], [10], [11].

Sub-Chapter Discussion

1. Descriptive Test

This study involved 40 respondents with two main variables: Active Learning and Material Comprehension. For the Learning Activity variable, the average score was 42.00, with a minimum score of 38 and a maximum score of 47. The standard deviation of 3.735 indicates a low data distribution, meaning that most respondents had relatively similar levels of learning activity. This relatively high average indicates that, in general, respondents demonstrated a good level of learning activity.

Meanwhile, for the Material Understanding variable, the average score was 66.50, with a minimum score of 51 and a maximum score of 76. The standard deviation of 6.259 indicates greater variation among respondents in terms of material understanding. Nevertheless, the high average score still reflects that respondents' level of material understanding is generally considered good [12], [13].

Overall, both variables showed high average scores, with relatively even learning activity among respondents, and greater diversity in material understanding.

2. Validity Test

The data obtained from the questionnaire distribution was then analyzed to test the validity of each item in the research instrument. Validity testing aims to determine the extent to which the questionnaire items can evaluate the research variables to be measured. In this study, validity was tested by calculating the correlation coefficient between each item's score and the total score using the Pearson Product Moment Correlation formula. This test was chosen because it is suitable for both interval and ratio data and can demonstrate the strength of the linear relationship between two variables: the item's score and the respondent's total score [14].

Validity was determined by comparing the calculated r value with the table r at a 5% significance level (α = 0.05). The number of respondents, 40, resulted in a number of degrees of freedom (df) obtained from the formula n – 2, namely 40 – 2 = 38. Referring to the Product Moment r table, the table r value for df = 38 was recorded at 0.312. An item is considered valid if the calculated r value is higher than the table r (calculated r > 0.312), indicating that the statement has a significant relationship with the total instrument score.

ITEM	R HITUNG	R TABEL TARAF 0,05 ; N = 38	STATUS
X 1	0,360	0,312	Valid
X 2	0,453	0,312	Valid
X 5	0,563	0,312	Valid
X 6	0,515	0,312	Valid
X 7	0,362	0,312	Valid
X 9	0,564	0,312	Valid
X 11	0,505	0,312	Valid
X 12	0,436	0,312	Valid
X 14	0,615	0,312	Valid
X 16	0,388	0,312	Valid
X 18	0,590	0,312	Valid
X 19	0,523	0,312	Valid
X 20	0,436	0,312	Valid
X 22	0,560	0,312	Valid
X 24	0,483	0,312	Valid

Figure 15. Validity of Material Understanding

Based on the test results in Table 1, "Validity of Material Understanding," it was found that all statement items in the material understanding variable had correlation values above 0.312. This indicates that each statement item adequately represents the construct being measured, thus the instrument for the material understanding variable can be considered valid. Therefore, the answers provided by participants truly reflect the extent of their understanding of the material taught, without being influenced by factors other than those variables.

ITEM	R HITUNG	R TABEL TARAF 0,05 ; N = 38	STATUS
Y 2	0,532	0,312	Valid
Y 3	0,434	0,312	Valid
Y 4	0,516	0,312	Valid
Y 5	0,586	0,312	Valid
Y 6	0,672	0,312	Valid
Y 7	0,419	0,312	Valid
Y 8	0,769	0,312	Valid
Y 9	0,466	0,312	Valid
Y 10	0,513	0,312	Valid
Y 11	0,326	0,312	Valid
Y 12	0,559	0,312	Valid
Y 14	0,513	0,312	Valid
Y 15	0,678	0,312	Valid

Figure 16. Validity of Class Discussion Activity

Furthermore, the results listed in Table 2 (Validity of Class Discussion Activity) show that each item in the Class Discussion Activity variable also exhibits a higher correlation value than the table's r (0.312). This indicates that each statement in the variable makes a significant contribution to the overall measurement of class discussion activity. Therefore, it can be seen that the tool used to assess class discussion activity meets the requirements of content and empirical validity and is capable of collecting accurate and representative data regarding the level of student participation in discussion activities in the learning environment.

3. Reliability Test

Based on data processing using IBM SPSS Statistics, a Cronbach's Alpha value of 0.988 was obtained for a total of 40 items. This value indicates that the research instrument has a very high level of reliability, as it falls into the category of $\alpha \geq 0.90$. This high reliability value also supports the analysis results, which indicate that active student participation in discussion activities positively contributes to understanding the lecture material. Students who participate more frequently in discussions, whether by expressing opinions, providing responses, or explaining specific concepts, tend to have a more comprehensive understanding. Through these interactions, students have the opportunity to construct their own knowledge and strengthen their conceptual understanding of the topics being studied. Therefore, the more active students are in discussions, the better their understanding of the lecture material [15], [16].

4. Normality Test

A normality test was conducted to ensure that the data for the discussion activity and material understanding variables had a normal distribution pattern. This test used the Kolmogorov-Smirnov and Shapiro-Wilk methods using IBM SPSS Statistics. Based on the analysis results, the significance value for each variable was 0.200, which is greater than 0.05. Thus, both variables were declared normally distributed and met the basic assumptions of parametric analysis required for subsequent hypothesis testing [17], [18], [19].

These findings indicate that the distribution of respondent data for both discussion activity and material understanding indicators was relatively even around the mean. This indicates there were no significant deviations or extreme values that could affect the analysis results. With a normal data distribution, it can be said that the research data depicts actual conditions in the field more representatively and objectively.

Furthermore, the results of the normality test show that student responses to the research instrument were consistent and homogeneous. Most students responded in line with the questionnaire statements, both regarding discussion participation and mastery of the material. This condition supports the validity and reliability of the data, as statistical analyses such as correlation or regression tests can be conducted appropriately. By meeting the assumption of normality, the relationship between class discussion engagement and material understanding can be analyzed parametrically, yielding more accurate and scientifically justifiable results [20].

5. Homogeneity Test

The homogeneity test was conducted to determine whether the variances between data groups in the research variables were the same or different. This test used the Levene's test processed using IBM SPSS Statistics. Based on the analysis, the significance value was 0.006, which is less than 0.05 (Sig. < 0.05). These results indicate that the data is not homogeneous, and the variances between respondent groups differ significantly.

This inhomogeneity of variance indicates that the data distribution across each respondent group is uneven. In other words, there are differences in the level of diversity in answers between one group and another. This can be caused by factors such as

differences in learning experience, level of participation in discussions, and individual abilities to understand the material. These differences illustrate that students' responses to the research variables are not uniform, but rather vary according to their individual characteristics.

Although the test results indicate that the data does not meet the homogeneity assumption, this does not completely hinder the analysis process. Researchers can continue testing using non-parametric methods or statistical techniques that are more tolerant of violations of the homogeneity assumption. By considering these results, researchers can interpret the data more carefully to ensure that the conclusions drawn remain accurate and reflect the true nature of the research data.

6. Linearity Test

Based on the results of the linearity test conducted using the ANOVA Test of Linearity in SPSS, the linearity component achieved a significance value of 0.019, which is less than the 0.05 threshold. This indicates a significant linear relationship between the variables of class discussion activity (X) and material understanding (Y). Meanwhile, the deviation from linearity component achieved a significance value of 0.097, which is greater than 0.05, indicating that the linear relationship model adequately describes the relationship between the two variables, with no non-linear patterns to consider. These two results reinforce the assumption that active participation in class discussions plays a crucial role in shaping students' understanding of the learning material. With a linear and consistent relationship, increasing active participation in discussions can be an effective strategy for improving student learning outcomes.

7. F Test (ANOVA)

The results show that the Discussion Activity variable has a significant effect on the dependent variable, although the direction of the effect is negative, with a regression coefficient of -0.051. Meanwhile, the "Understanding of Material" variable indicates that the level of student understanding of the material in this study did not directly affect the dependent variable. Furthermore, the coefficient of determination (R-Square) of 0.222 indicates that the regression model used was only able to explain 22.2% of the variation in the dependent variable, while the remaining 77.8% was influenced by other variables not included in the model. This confirms that the dynamics of the dependent variable are influenced by many other factors that require further investigation. Variables such as learning motivation, learning style, social environment, and lecturer support could be additional variables with significant influences. Active discussion is indeed significant, but its negative influence requires researchers to delve deeper into the context and mechanisms that occur in the learning process. While understanding of the material in this context does not have a direct impact, further research involving mediating or moderating variables is important to describe a more comprehensive relationship.

8. Simple T-Test

The analysis results show a significant difference between active class discussion and student understanding of the material. The average score for understanding of the material was recorded as higher than active discussion, with a difference of 24.5 points

at a significance level of 0.000. This indicates that although students demonstrate a good level of understanding of the material, this is not always accompanied by high participation in class discussions. On the other hand, the correlation results show a value of 0.341 with a significance level of 0.031, indicating a significant positive relationship between active discussion and understanding of the material. In other words, students who are more active in discussions tend to have better understanding. This finding supports the constructivist perspective, which emphasizes that learning processes involving social interaction can strengthen conceptual understanding. However, the striking difference in average scores also suggests the possibility that some students gained understanding through other channels, such as independent learning, the use of digital learning media, or additional learning resources. Therefore, while class discussions play an important role, it is important for instructors to consider the diversity of student learning styles to ensure all students achieve optimal understanding of the material.

Table 1. Data from Descriptive Statistical Analysis

Component	Findings
Number of respondents	40 students
Independent variable (X)	Activeness in Classroom Discussion
Dependent variable (Y)	Comprehension of Learning Material
Average activeness score (X)	42.00
Minimum activeness score	38
Maximum activeness score	47
Standard deviation of activeness	3.735
Average comprehension score (Y)	66.50
Minimum comprehension score	51
Maximum comprehension score	76
Standard deviation of comprehension	6.259
Validity test result	All items are valid (r calculated > 0.312)
Reliability test result	Cronbach's Alpha = 0.988 (highly reliable)
Normality test result	Sig. = 0.200 (data are normally distributed)
Homogeneity test result	Sig. = 0.006 (data are not homogeneous)
Linearity test result	Linearity Sig. = 0.019; Deviation Sig. = 0.097 (significant linear relationship)
Correlation test (R)	0.471
Coefficient of determination (R^2)	0.222
t-test result	t = -25.412; Sig. = 0.000 (significant effect)
Simple correlation test	r = 0.341; Sig. = 0.031 (significant positive correlation)

Table 2. ANOVA Test Results (F Test)

Source of Variance (SV)	df	Sum of Squares (SS)	F-value	F-table (α = 0.05)	Decision
Regression (between variables)	1	3.0018	0.1054	4.28	F-value < F-table → Not significant simultaneously
Residual (within variables)	23	654.8397	-	-	-
Total	24	657.8411	-	-	-

Note:

The calculated F-value of 0.1054 is smaller than the F-table of 4.28, so the simple regression model is not simultaneously significant. However, the t-test results show a significant partial effect, so active discussion still contributes positively to students' understanding of the material.

CONCLUSION

Fundamental Finding : This study confirms a positive and significant relationship between students' activeness in classroom discussions and their comprehension of learning materials. Active participation was found to enhance students' understanding, as indicated by the coefficient of determination ($R^2 = 0.222$), showing that classroom discussion activity contributes meaningfully to learning outcomes. **Implication :** These findings suggest that encouraging student-centered and interactive learning strategies can improve academic comprehension and engagement. Teachers should adopt collaborative methods such as problem-based learning and digital discussion platforms to promote deeper cognitive processing and meaningful learning experiences. **Limitation :** The study's scope was limited to quantitative analysis, focusing solely on the variables of discussion activeness and material comprehension, without exploring psychological or contextual factors that may also affect learning outcomes. **Future Research :** Subsequent studies are encouraged to incorporate additional variables such as motivation, learning style, and critical thinking skills, as well as employ mixed-methods approaches to gain a more comprehensive understanding of how classroom dynamics influence student learning performance.

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* **Mifta Sherlyna Ayuningtyas (Corresponding Author)**
State University of Surabaya, Indonesia
Email: 24010714165@mhs.unesa.ac.id

Novia Yonatri Muliyana
State University of Surabaya, Indonesia
Email: 24010714168@mhs.unesa.ac.id

Niken Roqhilia Amru
State University of Surabaya, Indonesia
Email: 24010714248@mhs.unesa.ac.id

Reva Rahma Zhauqi
State University of Surabaya, Indonesia
Email: 24010714147@mhs.unesa.ac.id