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The Effect of the Group Investigation (GI) Teaching Model on Elementary Students' Learning Outcomes in Thematic Learning

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A B S T R A C T

Background: In response to the growing need for student-centered learning approaches in elementary education, the Group Investigation (GI) model offers a collaborative framework that encourages active participation, critical thinking, and meaningful learning. Thematic learning, which integrates multiple subjects around a central theme, benefits from such interactive models that foster deeper understanding and engagement. **Objective:** This study examines the impact of the Group Investigation (GI) learning model on students' learning outcomes in thematic learning at SD IT UMMI Kota Bengkulu. **Method:** Using a quantitative experimental approach with a nonequivalent group posttest design, this research compares students' learning outcomes between an experimental class (applying the GI model) and a control class (using conventional methods) through pretests and posttests. **Results:** The GI model had a significant effect on students' learning outcomes. The mean score of the experimental class (0.46) was higher than that of the control class (0.35), with a confidence interval of the difference ranging from 0.10 to 18.77 at a 5% significance level. This indicates an average learning outcome improvement of 0.10. **Conclusion:** The GI model is effective in enhancing conceptual understanding, social interaction, collaboration, and critical thinking skills among students. **Contribution:** This study contributes by recommending the GI model as an innovative teaching strategy and serving as a reference for future research on collaborative learning methods.

K E Y W O R D S

Group Investigation (GI); Teaching Model; Students' Learning Outcomes; Thematic Learning Media

A R T I C L E H I S T O R Y

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C O N T E N T

1. INTRODUCTION

Learning is a primary determinant of educational success. It is a two-way communication process in which teaching is carried out by educators, while learning is undertaken by students. At its core, learning is an interaction between teachers and students, either through direct interaction such as face-to-face instruction or indirect methods using various learning media (Nurfadhillah et al., 2021). Teachers must understand the essence of the subject matter they teach as a means to develop students' critical thinking skills. They should also be familiar with different instructional models that can stimulate students' learning motivation through well-planned teaching strategies (Iswanto & Widayati, 2021).

To establish a high-quality learning process, teachers often encounter challenges in delivering subject matter. This is particularly true for thematic teachers, who still face limitations in effectively conducting lessons in schools

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(Wahyuningsih & Umaeroh, 2021). One key challenge is the difficulty in providing a concrete representation of the material, which directly affects the quality and consistency of student learning outcomes. This issue persists as long as mathematics teachers continue to view themselves as the primary source of knowledge while overlooking the role of instructional media. In the teaching and learning process, unclear material can be made more comprehensible through media as a facilitating tool (Sari et al., 2023). Complex learning materials can be simplified with the help of media, which can communicate ideas beyond what teachers can express verbally. Therefore, instructional media play an important role in capturing students' interest, engaging them in learning, and increasing their enthusiasm for the subject matter.

The use of instructional media helps teacher's present lessons in a way that is more engaging, enabling students to grasp the material more effectively and ultimately improve their academic performance (Sartika et al., 2020). With visually and interactively appealing media, students can better understand concepts, leading to positive impacts on their learning outcomes (Dewi & Lestari, 2020).

Moreover, integrating instructional media into the learning process can stimulate students' curiosity, enhance motivation, and even influence their psychological engagement (Rahma, 2019). Using media during the orientation phase of learning significantly improves the effectiveness of instruction, the clarity of concepts, and the transmission of knowledge (Wahid, 2018). The success of learning can be measured by students' comprehension levels and academic achievement. The higher the students' understanding of the material and their learning outcomes, the more effective the learning process. This requires an appropriate instructional model tailored to the learning objectives.

Thematic learning in elementary schools integrates multiple subjects into a cohesive learning experience, making it essential to adopt teaching strategies that promote meaningful engagement (Moslimany et al., 2024). The GI model provides an opportunity for students to work in groups, investigate real-world problems, share ideas, and construct their own understanding of concepts (Healy & Walshe, 2020). This collaborative process not only improves academic performance but also enhances social interaction and communication skills (Qureshi et al., 2023).

This study explores the implementation of the Group Investigation (GI) model in thematic learning at SD IT UMMI Kota Bengkulu. The minimum competency standard (KKM) for thematic learning at the school was determined through interviews with classroom teachers. Group Investigation (GI) is an instructional model in which students are free to form groups based on subtopics of interest, conduct research, compile reports, present their findings, and exchange information collaboratively.

Classroom observations at SD IT UMMI Kota Bengkulu revealed that teachers typically start the lesson by greeting students, checking attendance, and proceeding with instruction. Students are asked to open their textbooks and read, after which the teacher explains the material, poses questions, and allows students to discuss and work in pairs. While students work on assignments, the teacher observes and occasionally calls on students randomly to present their answers. The lesson concludes with a summary, practice exercises, and a closing greeting.

Based on classroom observations, only a few students actively participated in learning activities listening attentively, taking notes, presenting their work, answering questions, and engaging in discussions. However, a significant number of students remained passive, merely listening to the teacher's explanations without actively participating. Furthermore, the teacher did not incorporate instructional media, and lessons were conducted in a subject-by-subject sequence rather than an integrated thematic approach.

The initial observations indicated that while thematic learning was being implemented, teachers relied primarily on lecture, question-and-answer, and assignment-based methods. To enhance student motivation and ensure active engagement in thematic learning, it is essential to incorporate appropriate instructional models and media. The Group Investigation (GI) model offers a collaborative learning experience, allowing students to conduct research, express opinions, develop ideas, and form conclusions while working together with peers. By implementing GI, learning becomes more engaging, fostering active student participation and deepening comprehension of the subject matter.

This study provides empirical evidence on the effectiveness of the Group Investigation (GI) model compared to traditional teaching methods, which are still widely used in elementary schools. In particular, it highlights the impact of GI in thematic learning, which requires the integration of multiple subjects. By considering local educational contexts and policies, this research offers recommendations for teachers and policymakers to develop innovative, collaborative, and student-centered teaching strategies. Therefore, this study not only enriches academic discourse on GI but also provides new insights into the implementation of inquiry-based learning models in elementary education.

2. METHOD

2.1. Research Design

SThis study employs a quantitative experimental approach using a nonequivalent group posttest design. In this design, the experimental and control groups are not selected randomly (non-random). The research begins by administering a pretest to students in both the experimental and control groups to establish a baseline score before the intervention. The experimental group then receives instruction using the Group Investigation (GI) model, while the control group continues with conventional teaching methods. After the learning process is completed, a posttest is conducted to measure changes in students' learning outcomes in thematic learning.

2.2. Research Subjects

This study was conducted at SD IT UMMI in Bengkulu City. The research sample consisted of 40 students, divided into two groups: (1) Group A (Experimental Group): 20 students; (2) Group B (Control Group): 20 students. The sample was selected using purposive sampling, considering students' learning abilities and academic levels to ensure research validity. The population of this study comprised all fourth-grade students at SD IT UMMI Bengkulu City, totaling 56 students from Class IV A and IV B. The study was conducted over one month, from January 3 to February 14, 2024.

2.3. Data Collection

Data in this study were collected using several techniques: (1) Observation to monitor students' learning activities during the implementation of the Group Investigation (GI) model; (2) Documentation to gather data related to student profiles, curriculum, and school policies; (3) Learning Outcome Tests pretest and posttest were used to measure students' learning improvements after the intervention.

2.4. Analisis Data

The collected data were analyzed using descriptive and inferential statistical methods. The data analysis steps included: (1) Normality Test to ensure that the learning outcome data follow a normal distribution; (2) Homogeneity Test to verify that the variances of both groups (experimental and control) are equal; (3) t-Test (Independent Sample t-Test) – to determine significant differences in learning outcomes between the experimental and control groups after the intervention.

3. RESULT AND DISCUSSION

3.1 Result

a) Description of Pretest and Posttest Data

The pretest results of the control group are presented in the following table:

Table 1. Descriptive Statistics of Control Group Pretest

Statistics		
		Pretes Kontrol
N	Valid	27
	Missing	0
	Mean	9.00
	Median	9.00
	Mode	9
	Std. Deviation	1.109
	Variance	1.231
	Range	5
	Minimum	7
	Maximum	12
	Sum	243

From the table above, it can be seen that the posttest scores of the experimental class, based on a sample of 27 students, had a mean (average score) of 9.00, a median (middle value) of 9.00, and a mode (most frequently occurring score) of 9. The standard deviation was 1.109, the variance was 1.231, and the range was 5. The lowest score was 7, the highest score was 12, and the total pretest score of the control class was 243.

The posttest results of the control group are presented in the following table:

Table 2. Descriptive Statistics of Control Group Posttest

Statistics		
	Postes Kontrol	
N	Valid	27
	Missing	0
	Mean	12.22
	Std. Error of Mean	.252
	Median	12.00
	Mode	11[a]
	Std. Deviation	1.311
	Variance	1.718
	Range	5
	Minimum	10
	Maximum	15
	Sum	330

From the table above, it can be seen that the posttest scores of the experimental class, based on a sample of 27 students, had a mean (average score) of 12.22, a median (middle value) of 12, and a mode (most frequently occurring score) of 11. The standard deviation was 1.311, the variance was 1.718, and the range was 5. The lowest score was 10, the highest score was 15, and the total posttest score of the control class was 330.

The pretest results of the experimental group are presented in the following table:

Table 3. Descriptive Statistics of Experimental Group Pretest

Pretest Eksperimen		
N	Valid	26
	Missing	0
	Mean	8.54
	Median	8.50
	Mode	7
	Std. Deviation	1.240
	Variance	1.538
	Range	4
	Minimum	7
	Maximum	11
	Sum	222

From the table above, it can be seen that the posttest scores of the experimental class, based on a sample of 26 students, had a mean (average score) of 8.54, a median (middle value) of 8.50, and a mode (most frequently occurring score) of 7. The standard deviation was 1.240, the variance was 1.538, and the range was 4. The lowest score was 7, the highest score was 11, and the total pretest score of the control class was 222.

The posttest results of the experimental group are presented in the following table:

Table 4. Descriptive Statistics of Experimental Group Posttest

Postes Eksperimen		
N	Valid	26
	Missing	0
	Mean	12.96
	Median	13.00
	Mode	13
	Std. Deviation	1.248
	Variance	1.558
	Range	4
	Minimum	11
	Maximum	15
	Sum	337

From the table above, it can be seen that the posttest scores of the experimental class, based on a sample of 26 students, had a mean (average score) of 12.96, a median (middle value) of 13, and a mode (most frequently occurring score) of 13. The standard deviation was 1.248, the variance was 1.558, and the range was 4. The lowest score was 11, the highest score was 15, and the total posttest score of the control class was 337.

b) Normality Test

The normality test is used to determine whether the collected data follows a normal distribution or comes from a normally distributed population. To ensure this, a statistical normality test should be conducted as a form of validation. In this study, the Kolmogorov-Smirnov test was used to assess data normality.

Table 5. Normality Test Results

Tests of Normality				
	Class	Kolmogorov-Smirnov[a]		
		Statistic	df	Sig.
Learning Outcomes	Pretes_Kontrol	.167	27	.052
	Postes_Kontrol	.155	27	.097
	Pretes_Ekperimen	.168	26	.057
	Postes_Ekperimen	.166	26	.063

The decision rule for the normality test is based on probability values. If the probability value is > 0.05, the data is normally distributed. If the probability value is ≤ 0.05, the data is not normally distributed. Based on this criterion, all data in this study is normally distributed, allowing for further analysis using parametric statistical methods.

c) Homogeneity Test

The homogeneity test was conducted using a significance level of 5% (α = 0.05). The criteria for the homogeneity test are as follows: If the significance value (sig) Based on Mean is > 0.05, the data is homogeneous. If the significance value (sig) Based on Mean is < 0.05, the data is not homogeneous.

Table 6. Homogeneity Test Results

Test of Homogeneity of Variance					
		Levene Statistic	df1	df2	Sig.
Learning Outcomes	Based on Mean	1.094	3	102	**.355**
	Based on Median	.845	3	102	.473
	Based on Median and with adjusted df	.845	3	94.160	.473
	Based on trimmed mean	1.072	3	102	.364

The results of the data testing for the experimental and control groups showed a significance (sig) Based on Mean value of 0.355. This indicates that at a significance level of α = 0.05 (5%), the sig Based on Mean is > 0.05. Therefore, it can be concluded that both test samples come from a population with homogeneous (equal) distribution.

d) Hypothesis Testing

To determine the effect of the Group Investigation model on students' learning outcomes in thematic learning at SD IT UMMI, Bengkulu City, an independent two-sample difference test was used. After conducting pretests and posttests in the control and experimental classes, the data was analyzed using Normalized Gain.

Table 7. Descriptive Statistics of Class N-Gain

Group Statistics					
	Class	N	Mean	Std. Deviation	Std. Error Mean
Learning Outcomes	Ngain Postes Kontrol	27	.3500	.16932	.03259
	Ngain Postes Eksperimen	26	.4588	.15642	.03068

The data analysis results in the table show a comparison of students' posttest learning outcomes. In the control class, with a sample size (N) of 27 students, the average pretest learning outcome was 0.35 with a standard deviation

of 0.17. Meanwhile, in the experimental class, with a sample size of 26 students, the average posttest learning outcome was 0.46 with a standard deviation of 0.16.

Table 8. Independent Samples Test for N-Gain

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Learning Outcomes	Equal variances assumed	.048	.827	-2.428	51	.019	-.10885	.04482	-.19883	-.01886
	Equal variances not assumed			-2.432	50.916	.019	-.10885	.04475	-.19870	-.01900

For the t-test for equality of means, the value used is from the equal variances assumed row. In this row, the significance (sig) value is 0.019. According to the decision-making rule, if Sig < 0.05, then H_0 is rejected and H_a is accepted, meaning there is a significant difference in the average normalized gain between the class taught using the conventional method and the class taught using the Group Investigation (GI) method. The experimental class, which was taught using the GI method, achieved a higher average normalized gain.

3. 2 Discussion

The study revealed that the Group Investigation (GI) model significantly influenced students' learning outcomes in thematic learning at SD IT UMMI Kota Bengkulu. There was a significant difference in thematic learning outcomes between students who used the Group Investigation (GI) model and those who were taught using conventional methods. To assess the impact of different teaching models, each class was given a posttest at the end of the session.

The interaction occurred not only between students and researchers but also among students themselves, as well as between students and learning materials. These interactions took place in both small and large groups within the classroom. The GI model encouraged students to spend more time learning, which led to increased motivation and active participation in expressing their opinions and ideas. Students felt more comfortable sharing their thoughts, asking questions, and answering them. This was supported by the use of textbooks as learning aids, which were integrated into the steps of the Group Investigation (GI) model.

A multiple-choice test was used to assess students' understanding of the material taught, with both pretests and posttests conducted in the control and experimental classes. The collected test data underwent classical assumption tests, including a normality test using the Kolmogorov-Smirnov test, which confirmed that all samples had a normal distribution (Sig. > 0.05). Additionally, a homogeneity test showed that the based on mean value was 0.355 > 0.05, indicating that both datasets were homogeneous. Since both assumptions were met, hypothesis testing was conducted using parametric statistical analysis with a t-test.

Analysis of Learning Outcomes in the Control Class: In the control class, the pretest average score was 9.00 with a standard deviation of 1.109. After the intervention using conventional teaching methods, the posttest average score increased to 12.22, with a standard deviation of 1.423. This indicated an improvement in learning outcomes from the pretest to the posttest. The independent samples t-test for equal variances assumed showed a Sig. value of 0.00 < 0.05, meaning there was a significant change in learning outcomes from the pretest to the posttest in the control class.

Analysis of Learning Outcomes in the Experimental Class: In the experimental class, with 26 students, the pretest average score was 8.54, with a standard deviation of 1.240. After applying the Group Investigation (GI) model, the posttest average score increased to 12.96, with a standard deviation of 1.248. The independent samples t-test showed a Sig. value of 0.00 < 0.05, indicating a significant change in students' learning outcomes from pretest to posttest in the experimental class.

Comparison Between Experimental and Control Groups: The posttest hypothesis test between the experimental and control groups showed that in equal variances assumed, the Sig. (2-tailed) value was 0.000 < 0.005 at a 5% significance level. This result confirmed a significant difference in students' knowledge between the experimental and control classes, demonstrating the positive impact of the Group Investigation (GI) model on thematic learning outcomes at SD IT UMMI Kota Bengkulu.

According to Agus Suprijono, one of the factors influencing learning outcomes is the presentation of learning materials in an engaging, non-monotonous, and easily understandable manner, which positively affects students' academic success. In the experimental class, where students were engaged in Group Investigation (GI)-based learning, the model encouraged student interaction and participation, helping them analyze problems collaboratively (Hidayati et al., 2021).

These findings align with research conducted by Kartini et al. (2022), which also identified a positive effect of the Group Investigation (GI) cooperative learning model on students' mathematics learning outcomes. Similarly, Sholikha & Alwin (2023) found that both the STAD and GI models significantly improved students' Biology learning outcomes. Additionally, Widiawati et al. (2018) demonstrated that the Group Investigation (GI) model positively influenced students' physics learning outcomes, specifically in static fluid material.

Further research by Purwoko (2021) confirmed that the cooperative learning model, particularly the Group Investigation (GI) type, positively affected students' learning outcomes. Meanwhile, Pratami et al. (2019) found that the application of the Group Investigation (GI) model enhanced students' social science learning abilities, particularly in economic activities at the elementary school level. In a classroom action study conducted by Purwoko, findings showed an increase in learning outcomes from 75% to 89.48%, demonstrating the effectiveness of the Group Investigation (GI) model in improving social science learning.

The use of appropriate teaching methods plays a vital role in education, ensuring that learning objectives are achieved and helping students master the subject matter, especially in thematic learning (Mursid, 2021). In this study, visual learning aids (such as images in textbooks) were incorporated to enhance students' understanding and retention of the material. The Group Investigation (GI) model also encouraged students to develop their questioning, answering, and critical thinking skills during discussions (Christina & Kristin, 2016). Additionally, it boosted students' motivation by fostering a dynamic learning environment where they could actively engage with their peers and express their understanding, making the learning process more effective and impactful (Widyaningsih & Puspasari, 2021).

The success of Discovery Learning or any student-centered teaching model relies on both teachers and students. Teachers play a key role in classroom management, creating a learning atmosphere that encourages students to explore their full potential. When the teacher effectively facilitates learning, students gain confidence in their abilities, which ultimately enhances their learning outcomes.

This study is important because it provides empirical evidence on the effectiveness of the Group Investigation (GI) teaching model in improving students' learning outcomes in thematic learning at the elementary school level. Traditional teaching methods often emphasize passive learning, where students receive information without actively engaging in the learning process. In contrast, the GI model encourages collaboration, critical thinking, and problem-solving, which are essential skills for 21st-century education. By implementing this approach, educators can foster active participation, deeper understanding, and higher academic achievement among students. Additionally, the findings of this study can serve as a valuable reference for teachers, school administrators, and curriculum developers in designing more effective and student-centered learning environments. The study also highlights the need for continuous innovation in teaching methodologies to ensure that students are not only acquiring knowledge but also developing the skills necessary for lifelong learning. Furthermore, this research contributes to the broader field of education by encouraging further studies on cooperative learning models and their adaptability across different subjects and grade levels.

4. RESEARCH IMPLICATIONS

The findings of this study highlight the significant impact of the Group Investigation (GI) teaching model on students' learning outcomes in thematic learning at the elementary school level. The results suggest that the GI model fosters active student participation, collaboration, and critical thinking, leading to improved academic performance compared to conventional teaching methods. This has important implications for educators, as it encourages a shift from teacher-centered instruction to student-centered learning, where students engage in inquiry-based activities and teamwork. Teachers can integrate the GI model into their teaching strategies to enhance motivation, engagement, and deeper understanding of the material. Additionally, the study suggests that curriculum developers and policymakers should consider incorporating cooperative learning models like GI into elementary education to

align with 21st-century learning objectives. Schools can also explore ways to support group-based learning with technology, making it more adaptable to different learning environments. Moreover, the findings open opportunities for further research on the long-term impact of GI on student achievement, social skills, and adaptability across various subjects. Overall, this study reinforces the importance of collaborative and inquiry-based learning in enhancing elementary students' learning experiences and academic success.

5. RESEARCH RECOMMENDATION

For future research, it is recommended to compare the GI model with other instructional approaches or incorporate mediating and intervening variables in the study. For instance, integrating learning media or teaching aids relevant to the studied theory could provide deeper insights into the effectiveness of the applied learning model.

6. CONCLUSION

Based on the findings, it can be concluded that the Group Investigation (GI) model has a significant impact on students' learning outcomes in thematic learning at the elementary school level. This model fosters a more active learning environment, where students do not merely receive information passively but actively engage in exploration, discussion, and constructing their understanding of the subject matter.

The implementation of the GI model has been shown to improve students' conceptual understanding, as reflected in better learning outcomes compared to conventional teaching methods. Additionally, this model encourages active student participation, allowing them to work in groups, share ideas, and collaboratively solve problems. As a result, the GI model plays a role in developing critical thinking and teamwork skills, which are essential for students' academic and social growth. The GI model significantly enhances students' learning outcomes by providing a more engaging and interactive learning experience. Through its investigative approach, students have the opportunity to explore information independently and share their findings with peers. This process not only increases motivation but also fosters a sense of responsibility for their learning journey. Furthermore, the collaborative learning activities embedded in the GI model enhance students' communication and social interaction skills, which are highly valuable in modern education.

With these various benefits, implementing the GI model in thematic learning at the elementary school level can serve as an effective alternative instructional approach to improve both teaching quality and student learning outcomes. Educators can adopt this model as an innovative strategy to create a more dynamic, interactive, and collaborative learning environment. Moving forward, future research can further explore the effectiveness of the GI model across different subjects and combine it with other teaching methods to further enhance the quality of elementary education.

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AUTHOR CONTRIBUTION STATEMENT

The author declares that all data written in this article are original based on the results obtained and conducted in the field.

CONFLICT OF INTEREST STATEMENT

The Authors declares that the researcher has no potential conflict of interest in connection with this article's research, research, and/or publication.

ETHICAL APPROVAL STATEMENT

The authors declare that this study was conducted with due regard for research ethics, including obtaining approval from the institution. This includes respecting the autonomy of participants, maintaining confidentiality of data, and ensuring their safety and well-being, in accordance with applicable research ethics guidelines.

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