

THE EFFECT OF EXPERIMENTAL METHODS AND INSTRUCTIONAL LEARNING MODELS ON CREATIVITY AND LEARNING OUTCOMES THEMATIC FOR GRADE V STUDENTS

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ABSTRACT

The development of thematic learning requires teachers to apply approaches that can develop creativity while improving student learning outcomes. One approach that is considered relevant is the experimental method combined with the constructive learning model, because both emphasize meaningful learning activities and direct experience. Based on this background, this study aims to describe the application of the influence of the experimental method and the constructive learning model on the creativity and thematic learning outcomes of fifth-grade students at SDN 80 Kuri Lompo. This study uses a quantitative approach through a quasi-experimental Nonequivalent Control Group Design. The research sample consisted of 25 students selected using a purposive sampling technique. Data were collected through observation, questionnaires, tests, and documentation, then analyzed using normality tests, homogeneity, T-Test, and Mann-Whitney U Test. Learning success was measured through the implementation of learning and an increase in learning outcomes of at least 75% according to the Minimum Completion Minimum (KKM). The results showed that the average initial ability of students was 72.4 with 56% completeness. After the application of the experimental method and constructive learning, the average learning outcome increased to 86 with 88% classical completeness. Statistical tests showed a significant difference between the experimental and control groups ($p = 0.002 < 0.05$), so it can be concluded that the constructivism-based experimental method is more effective than conventional learning in improving student creativity and learning outcomes.

1. INTRODUCTION

Education is an important aspect in developing quality human resources. Education is crucial for humans so they can reflect on previously unfavorable behavior to become better, in accordance with the profile of Pancasila students, which was initiated as an important foundation for education in

Indonesia, not only as a national policy, but also as a guide for teachers in shaping student character at the classroom level. Pancasila students are lifelong learners who are not only competent academically, but also in terms of human interaction (Mulyadi et al, 2020) . In an effort to improve the quality of education, various learning methods and models continue to be developed, one of which is the experimental method and the constructive learning model. This method is designed to encourage students to be more active, creative, and critical in the learning process, especially in thematic learning that integrates various subjects in one theme (Arikunto, 2012) . The Quranic verse regarding education, QS. Shad verse 29, reads:

كُتِبَ أَنْزَلْنَاهُ إِلَيْكَ مُبَارَكًا لِيَدَّبَّرُوا آيَاتِهِ وَلِيَتَذَكَّرَ أُولُو الْأَلْبَابِ

The translation: *"This is a book that We have sent down to you full of blessings so that they will pay attention to its verses and so that those who have a mind can learn from it."*

The importance of mastering science

مَنْ أَرَادَ الدُّنْيَا فَعَلَيْهِ بِالْعِلْمِ، وَمَنْ أَرَادَ الْآخِرَةَ فَعَلَيْهِ بِالْعِلْمِ، وَمَنْ أَرَادَهُمَا فَعَلَيْهِ بِالْعِلْمِ

"Whoever wants the world, let him master knowledge. Whoever wants the afterlife, let him master knowledge. And whoever wants both (this world and the hereafter), let him master knowledge." (HR. Ahmad)

The experimental method emphasizes direct student involvement in learning activities through observation, experimentation, and verification of concepts, so that learning is not only teacher-centered but also student-centered. Through this method, students are given the opportunity to discover concepts independently based on real experiences, which can increase understanding and long-term retention of learning material. Meanwhile, the constructive learning model (constructivism) views learning as an active process in which students build new knowledge based on prior knowledge and experiences they already possess. In this model, the teacher acts as a facilitator who guides, motivates, and creates meaningful learning situations so that students can actively construct their own understanding (Juliana et al, 2023).

The application of experimental methods combined with a constructive learning model is highly relevant to thematic learning, because thematic learning requires students to connect concepts from various subjects into a unified and meaningful whole. By actively experimenting and constructing knowledge, students are encouraged to think critically, collaborate with peers, communicate ideas, and reflect on the learning process. These competencies are in line with the dimensions of the Pancasila Student Profile, such as critical reasoning, creativity, cooperation, independence, and noble character. Therefore, the use of experimental methods and constructive learning models is expected to be an effective alternative in improving learning outcomes while simultaneously strengthening student character in accordance with the values of Pancasila (Alwanda, 2025).

Education and educational regulations in Indonesia are formally regulated through Law Number 20 of 2003 concerning the National Education System (Sistem Pendidikan Nasional/Sisdiknas), which serves as the legal foundation for the implementation of education at all levels. In addition, the organization of education is further regulated through various government regulations, ministerial regulations, and regional regulations that aim to ensure the equitable distribution and quality of education throughout Indonesia. The 1945 Constitution of the Republic of Indonesia clearly mandates that every citizen has the right to receive education, and at the same time obliges every citizen to participate in basic education. To guarantee the fulfillment of this right, the government bears the responsibility of financing basic education as a form of commitment to developing educated, competent, and dignified human resource (Lestari & Halidjah, 2023).

However, various indicators show that the quality of education in Indonesia still requires serious attention. According to the Global League Table published by the international education firm Pearson, Indonesia's education system is ranked among the lowest, alongside countries such as Mexico and

Brazil. This ranking reflects the ongoing challenges faced by the Indonesian education system, including issues related to learning quality, student competencies, and instructional effectiveness. Therefore, improving the quality of education should not only focus on curriculum development and policy reform by the government, but must also be supported by improvements in classroom learning practices carried out by teachers (Rohmaniyah et al, 2025).

According to the Global League Table published by education firm Pearson, the Indonesian education system ranks at the bottom alongside Mexico and Brazil. This indicates that the current education system in Indonesia remains subpar. Improvements in education quality, in addition to government curriculum development, are also crucial to the learning process in the classroom. Creativity is crucial for successful learning. Learning becomes more enjoyable and lively when teachers have multiple ways to explore students' potential. Teachers must also be able to maximize students' cognitive and affective potential, thereby better accommodating new ideas (Hamzah, 2020) .

In thematic learning, particularly at the elementary school level, the role of the teacher becomes even more complex and significant. Teachers act not only as facilitators and motivators, but also as learners who continuously reflect on and improve their teaching practices. Thematic learning demands a high level of teacher creativity, as teachers must be able to identify relevant themes and sub-themes, integrate various subject contents into a single coherent theme, utilize learning media available in the surrounding environment, and uncover moral and character values embedded in the learning process (Rosyid et al., 2017).

Thematic learning is highly suitable for elementary school students because it connects abstract concepts with students' daily experiences, enabling them to understand learning materials more comprehensively. Through thematic learning, students are encouraged to see relationships between different subjects, which helps them build integrated knowledge structures. Nevertheless, in practice, many students still experience difficulties in learning actively and creatively. This condition is reflected in their low levels of creativity when completing assignments, limited initiative in learning activities, and unsatisfactory learning outcomes. Several factors contribute to this problem, including the use of monotonous and less varied learning methods, teacher-centered instructional approaches, and limited opportunities for students to actively engage in the learning process (Palupi & Husamah, 2023).

To address these challenges, the application of experimental methods and constructive learning models is considered a promising alternative. Experimental methods emphasize direct student involvement through hands-on activities, experimentation, observation, and problem-solving. Through this approach, students are encouraged to explore concepts independently, discuss findings with peers, and draw conclusions based on their own experiences. Meanwhile, the constructive learning model is grounded in the principle that knowledge is actively constructed by learners based on their prior knowledge and learning experiences. This model positions students as active subjects in learning, while teachers function as facilitators who guide and support the learning process (Jumanta, 2018) .

The integration of experimental methods and constructive learning models creates a more interactive, student-centered learning environment that stimulates creativity and critical thinking. Students are no longer passive recipients of information, but active participants who engage in meaningful learning experiences. Such an approach is expected to improve not only students' creativity, but also their understanding of learning materials and overall learning outcomes (Hizqiyah et al, 2023).

Based on preliminary observations conducted at SDN 80 Kuri Lombo, it was found that the thematic learning outcomes of fifth-grade students were still below the expected standards. In addition, students' creativity in completing thematic learning tasks was relatively low, as indicated by limited originality of ideas and minimal active participation during learning activities. These findings highlight the urgent need to implement more effective and innovative learning methods that can increase student

engagement, foster creativity, and ultimately improve learning outcomes. Therefore, the application of experimental methods combined with constructive learning models is expected to serve as an effective solution to overcome existing learning problems and enhance the quality of thematic learning at SDN 80 Kuri Lompo (Pupsaradi et al, 2024).

2. METHODS

This study used a quantitative approach with a quasi-experimental research type (quasi-experimental) of the *Nonequivalent Control Group Design type* involving an experimental class and a control class without random assignment. The study was conducted in grade V of SD Negeri 80 Kuri Lompo, Maros Regency for approximately one month. The purpose of this study was to determine the effect of the experimental method and the instructive learning model on students' creativity and thematic learning outcomes. The independent variables in this study consisted of the experimental method (X1) and the instructive learning model (X2), while the dependent variables were students' creativity (Y1) and thematic learning outcomes (Y2). The research instruments consisted of observation sheets, creativity questionnaires, learning outcome tests, and documentation. Variable measurements used a Likert scale, while analyses of validity, reliability, difficulty level, and discrimination power were conducted to ensure the quality of the instruments. Data collection techniques included observation of teacher and student activities, administration of pretests and posttests, and documentation. Before the hypothesis test was conducted, the data were analyzed through prerequisite tests in the form of normality and homogeneity tests using SPSS. The main hypothesis test uses *the Independent Sample T-Test* for normally distributed and homogeneous data, and *the Mann-Whitney U Test* for data that does not meet the requirements for parametric testing. The results of the analysis are expected to provide an empirical picture of the effectiveness of experimental methods and instructive learning models in improving creativity and thematic learning outcomes of fifth-grade students.

3. RESULTS AND DISCUSSION

This research was conducted at SD Negeri 80 Kuri Lompo in thematic subjects for fifth-grade students over six sessions. The first session was used for a pretest to determine students' initial abilities. The second through fifth sessions included treatment, implementing experimental methods and constructive learning models through experimental activities, discussions, and group work that encouraged creativity and problem-solving. The sixth session was used for a posttest to measure improvements in students' creativity and learning outcomes after the treatment.

Description of Observation Results

Table 1. Results of Observations on the Implementation of Learning in Meetings I – VI

Meeting	Average Score	Category	Information Criteria
I	3.10	Well executed	$2.5 < x \leq 3.5$
II	3.43	Well executed	$2.5 < x \leq 3.5$
III	3.57	Well executed	$2.5 < x \leq 3.5$
IV	3.36	Well executed	$2.5 < x \leq 3.5$
V	3.86	Well executed	$2.5 < x \leq 3.5$
VI	3.71	Well executed	$2.5 < x \leq 3.5$
Average	3.5	Well executed	$2.5 < x \leq 3.5$

Source: Processed data, 2025

Based on the results of observations of the implementation of learning from meetings I to VI, an average score of 3.5 was obtained with a well-implemented category, which indicates that the entire learning series went according to plan. In the pretest stage, students were still passive because the focus of activities was on measuring initial abilities. Entering the treatment stage at meetings II to V, an increase in student engagement, creativity, and activeness was seen through the application of experimental methods and constructive learning models. Students became more accustomed to working collaboratively, thinking critically, and relating material to real experiences, although there was a slight fluctuation in scores at meeting IV. Meeting VI showed the highest implementation of learning, accompanied by an increase in student understanding and creativity during the posttest. Overall, the application of experimental methods and constructive models has been proven to have a positive impact on student readiness, activeness, and learning outcomes.



Figure 1. Implementation of the Instructive Learning Model

Description of Student Creativity Pre-Test and Post-Test

Table 2. Assessment of Student Creativity

No	Interval	Category	Pretest		Posttest	
			F	%	F	%
1	30 – 36	Very Creative	0	0%	7	28%
2	23 – 29	Creative	8	32%	15	60%
3	16 – 22	Quite Creative	17	68%	3	12%
4	9 – 15	Not Creative	0	0%	0	0%
Total			25	100%	25	100%

Source: Processed data, 2025

Based on the results of the student creativity assessment in the pretest and posttest, a significant increase was seen after the implementation of the experimental method and the constructive learning model. During the pretest, the majority of students were in the Moderately Creative (68%) and Creative (32%) categories, while no students were in the Very Creative category. After the treatment, the composition changed drastically, where 60% of students were in the Creative category and 28% reached the Very Creative category. The number of students in the Moderately Creative category decreased to 12%, and no students were classified as Not Creative. These results indicate that the learning provided was able to significantly and evenly increase student creativity. A more detailed visual representation of the student creativity assessment in the pretest and posttest stages is shown in the following diagram:

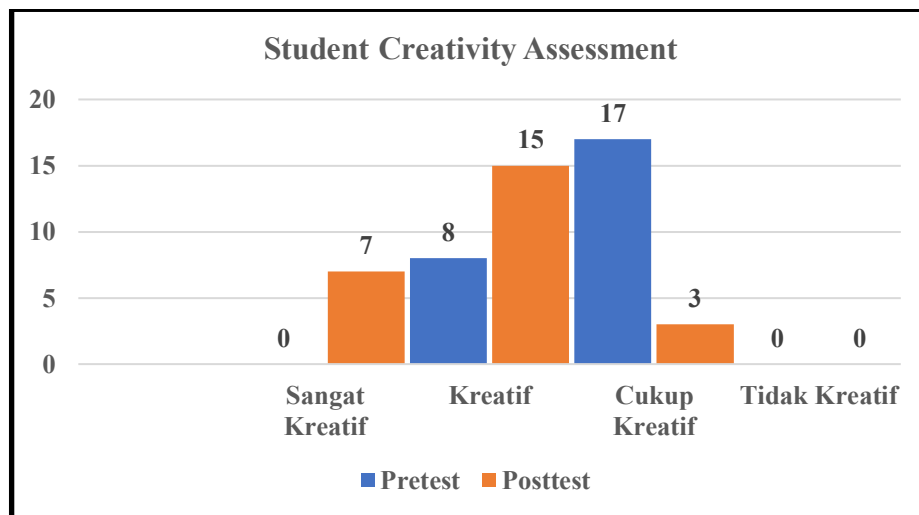


Figure 2. Student Creativity Diagram

Description of Pre-Test and Post-Test Learning Results

Table 3. Statistical Analysis of Learning Outcomes

Statistical Analysis	Pretest	Posttest
Mean	72.4	86
Median	80	80
Mode	80	80
Standard Deviation	17,387	11,180
Variance	302,333	125
Range	60	40
Minimum Score	40	60
Maximum Score	100	100

Source: Processed data, 2025

Based on the statistical analysis of learning outcomes, there was a clear improvement between pretest and posttest scores. The average student score increased from 72.4 to 86, indicating an increase in understanding after the treatment. Although the median and mode remained the same at 80, the distribution of student scores improved, indicated by a decrease in the standard deviation from 17.387 to 11.180 and a decrease in the variance from 302.333 to 125. The range of scores also narrowed from 60 to 40, indicating that student scores were more evenly distributed and consistent on the posttest. In addition, the minimum score increased from 40 to 60, while the maximum score remained at 100. Overall, these data indicate that learning using the experimental method and constructive model is effective in improving student learning outcomes both in terms of achievement and competency equity.

The categorization of student learning outcomes in the class before being given treatment (pretest) can be seen in the following table and diagram:

Table 4. Categorization of Learning Outcomes

No	Interval	Category	Pretest		Posttest	
			Frequency	Percentage	Frequency	Percentage
1	< 55	Very less	4	16%	0	0%
2	55 – 66	Not enough	4	16%	0	0%
3	65 – 79	Enough	3	12%	3	12%

4	80 – 89	Good	9	36%	10	40%
5	90 – 100	Very good	5	20%	12	48%
Total			23	100%	25	100%

Source: Processed data, 2025

Based on the results of the categorization of learning outcomes, there was a significant increase in student abilities after the learning treatment. In the pretest, some students were still in the Very Less (16%) and Not Enough (16%) categories, but in the posttest there were no more students in either category, indicating strong basic improvements. The number of students in the Good category increased from 36% to 40%, while the Very Good category experienced the most significant increase, from 20% to 48%. Although the Enough category remained at 12%, the overall composition showed a shift in student scores toward higher categories. Overall, these data prove that the application of experimental methods and constructive learning models can significantly and evenly improve the quality of student learning outcomes.

Table 5. Minimum Graduation Criteria for Learning Outcomes

Criteria	Mark	Pretest		Posttest	
		Frequency	Percentage	Frequency	Percentage
Passed	≥ 75	11	44%	3	12%
Not pass	< 75	14	56%	22	88%
Total		23	25	100%	25

Source: Processed data, 2025

Based on the learning outcome completion data, it appears that the number of students meeting the Minimum Passing Criteria ($KKM \geq 75$) actually decreased from the pretest to the posttest. In the pretest, 44% of students passed, while in the posttest only 12% achieved completion. Conversely, the percentage of students failing increased from 56% to 88%. These results indicate that despite an increase in average scores in the previous statistical analysis, the majority of students were still unable to achieve the set completion standards. This finding indicates the need for further evaluation of the suitability of the posttest question difficulty level, the implementation of learning, and student readiness for the final evaluation.



Figure 3. Posttest Implementation Process

Prerequisite Test

Table 6. Normality Test Results

Learning outcomes	Significance	
	Kolmogorov-Smirnov	Shapiro-Wilk
Pretest	0.035	0.091
Posttest	0.035	0.091

Source: Processed data, 2025

Based on the results of the Kolmogorov-Smirnov and Shapiro-Wilk normality tests, both the pretest and posttest data obtained significance values of 0.035 and 0.091. Because the Kolmogorov-Smirnov significance value is below 0.05, the pretest and posttest data are declared not normally distributed. Meanwhile, the Shapiro-Wilk significance value is above 0.05, so the data can be said to be normally distributed according to the Shapiro-Wilk criteria. This difference in results indicates that the data distribution is at the threshold of normality, so determining further analysis techniques requires careful consideration of both test results.

Table 7. Results of Homogeneity Test

Test of Homogeneity of Variance					
		Levene Statistics	df1	df2	Sig.
Learning outcomes	Based on Mean	4,295	1	48	.054
	Based on Median	1,567	1	48	.217
	Based on Median and with adjusted df	1,567	1	40,868	.218
	Based on trimmed mean	4.166	1	48	.057

Source: Processed data, 2025

The table above shows that the significance value obtained in the Levene test Based on Mean is 0.054, Based on Median is 0.217, Based on Median and with adjusted df is 0.218, and Based on Trimmed Mean is 0.057. All significance values are > 0.05, so it can be concluded that the pretest and posttest learning outcome data have homogeneous or equal variance. This indicates that the assumption of homogeneity of variance is met, so the data is suitable for further analysis using parametric statistical tests.

Table 8. Results of the Independent Sample T-Test

Variables	t	df	Sig. (2-tailed)	Mean Difference	95% CI (Lower–Upper)
Results	-3,289	48	0.002	-13.6	-21,913 – -5,287

Source: Processed data, 2025

Based on the table above, it shows that the significance value (Sig. 2-tailed) is 0.002, which is smaller than 0.05. This indicates that there is a significant difference in learning outcomes between the groups compared in this study. The *mean difference value* is -13.600 with a 95% confidence interval ranging from -21.913 to -5.287, so it can be ascertained that the difference did not occur by chance. These results prove that the treatment in the form of implementing a constructivist learning model with an experimental method has a significant effect on improving student learning outcomes. Thus, it can

be concluded that the applied learning strategy is more effective than the conventional method used previously.

4. CONCLUSIONS AND SUGGESTIONS

Based on the research results, the experimental method and constructive learning model were proven effective in improving creativity and thematic learning outcomes of fifth-grade students at SD Negeri 80 Kuri Lompo. Students' initial abilities still varied with an average of 72.4 and only 56% achieving the Minimum Competency (KKM), indicating that conventional learning was not optimal. After the treatment, the average learning outcome increased to 86, with the majority of students in the high and very high categories, and 88% exceeded the KKM. The difference test showed a significance of $0.002 < 0.05$ with a mean difference of -13.600, confirming that the experimental-based constructivist model was more effective than the conventional method. In addition to improving the completeness of learning outcomes, this approach also encourages student creativity through exploration activities, problem solving, and independent knowledge construction.

Based on the research findings, several suggestions can be made to support improvements in the quality of learning. Students are expected to be more active and courageous in engaging in experiments and discussions to develop creativity and critical thinking skills. Teachers are advised to continue implementing innovative learning methods, particularly experimental methods with a constructivist model, to make learning more meaningful and improve learning outcomes. Schools need to provide support in the form of facilities, resources, and training for teachers to ensure optimal implementation of active learning. Parents are also expected to play an active role in supporting their children's learning activities at home through motivation and opportunities to conduct simple experiments. Furthermore, future researchers are encouraged to expand the study to other levels or subjects and add variables such as motivation, learning interest, or critical thinking skills to produce more comprehensive findings.

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