

Studi Kuasi-Eksperimental tentang Pengaruh Pembelajaran Campuran Berbasis Google Classroom terhadap Minat Siswa terhadap Matematika

Amran Yahya^{1*}, Usman Mulbar²

¹Universitas Sulawesi Barat, Majene, Indonesia

²Universitas Negeri Makassar, Makassar, Indonesia

*e-mail: amranyahya53@gmail.com

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Abstrak

Penelitian ini bertujuan untuk menganalisis pengaruh model pembelajaran blended learning berbasis Google Classroom terhadap minat belajar matematika siswa. Meskipun berbagai studi menunjukkan bahwa integrasi teknologi dalam pembelajaran dapat meningkatkan keterlibatan siswa, masih terdapat keterbatasan penelitian yang secara spesifik mengkaji pengaruh blended learning terhadap minat belajar matematika menggunakan desain eksperimen semu pada konteks sekolah menengah di Indonesia. Oleh karena itu, penelitian ini penting untuk memberikan bukti empiris yang lebih kontekstual. Penelitian ini menggunakan pendekatan kuantitatif dengan desain kuasi-eksperimental berupa nonequivalent control group design. Sampel penelitian terdiri dari dua kelas XI MIPA di MAN 1 Polewali Mandar yang dipilih secara purposive, masing-masing sebagai kelas eksperimen dan kontrol dengan total 60 siswa. Data dikumpulkan menggunakan angket minat belajar matematika yang telah divalidasi dan dianalisis melalui uji normalitas, homogenitas, serta uji-t pada taraf signifikansi 5%. Hasil penelitian menunjukkan bahwa rata-rata minat belajar siswa pada kelas eksperimen (84,33) lebih tinggi dibandingkan kelas kontrol (72,67), dengan nilai $t_{hitung} = 4,567 > t_{tabel} = 2,000$ ($p < 0,05$). Temuan ini mengindikasikan bahwa blended learning berbasis Google Classroom berpengaruh signifikan terhadap peningkatan minat belajar matematika siswa. Implikasi dari hasil ini menunjukkan bahwa integrasi pembelajaran tatap muka dan digital mampu menciptakan pengalaman belajar yang lebih fleksibel, interaktif, dan relevan dengan karakteristik siswa di era digital, sehingga dapat menjadi alternatif strategi pembelajaran yang efektif bagi guru matematika.

Kata Kunci: *Blended Learning*; Google Classroom; Minat Belajar Matematika; Pembelajaran Digital

A Quasi-Experimental Study on the Effect of Google Classroom-Based Blended Learning on Students' Interest in Mathematics

Abstract

This study aims to analyze the effect of a Google Classroom-based blended learning model on students' interest in learning mathematics. Although previous studies have highlighted the potential of technology integration to enhance student engagement, there is still a lack of empirical research specifically examining its effect on mathematics learning interest using a quasi-experimental design in the context of Indonesian secondary education. Therefore, this study provides important contextualized empirical evidence. This research employed a quantitative approach with a quasi-experimental design using a nonequivalent control group design. The sample consisted of two classes of eleventh-grade students at MAN 1 Polewali Mandar, selected through purposive sampling, with a total of 60 students assigned to experimental and control groups. Data were collected using a validated mathematics learning interest questionnaire and analyzed through normality, homogeneity, and independent sample t-tests at a 5% significance level. The results showed that the mean score of students' learning interest in the experimental class (84.33) was higher than that of the control class (72.67), with $t_{count}=4.567 > t_{table}=2.000$ ($p<0.05$). These findings indicate that Google Classroom-based blended learning has a significant effect on improving students' interest in learning mathematics. The implication of this study suggests that integrating face-to-face and digital learning environments can create more flexible, interactive, and meaningful learning experiences, making it a promising instructional strategy for mathematics teachers in the digital era.

Keywords: Blended Learning; Google Classroom; Interest in Learning Mathematics; Digital Learning

1. Introduction

A. Background

The rapid development of information and communication technology has significantly transformed the field of education, particularly in integrating technology into the learning process. This transformation has been further accelerated by the COVID-19 pandemic, which forced educational institutions to adopt digital-based learning environments. Numerous studies indicate that the integration of technology in learning enhances student engagement, flexibility, and overall learning effectiveness (Dhawan, 2020; Hodges et al., 2020; Rasheed et al., 2020). In the context of mathematics education, technology integration has also been shown to improve student participation and learning activities (Fitriani et al., 2021; Hidayat & Widodo, 2020; Wicaksono et al., 2021).

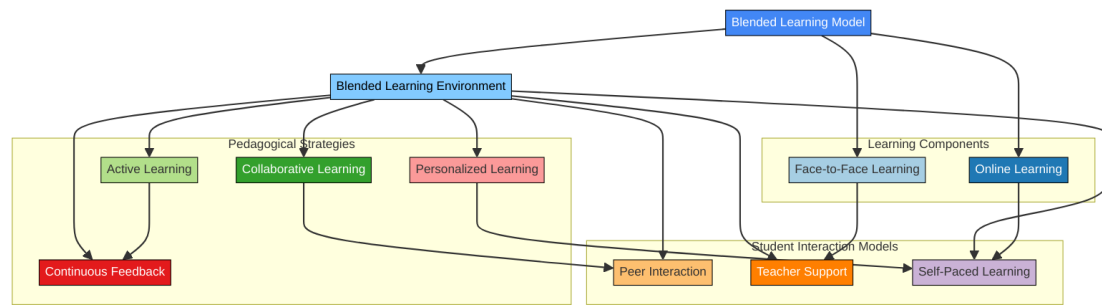
Despite these advancements, mathematics still faces significant challenges, particularly related to students' low interest in learning. Mathematics is often perceived as an abstract and difficult subject, which negatively affects students' engagement in the learning process. This condition contributes to lower levels of understanding and learning outcomes in mathematics (Verschaffel et al., 2020; Kaiser & Stender, 2022; Nurfadilah et al., 2021). Furthermore, low learning interest is closely associated with limited emotional and cognitive engagement in mathematical learning activities (Renninger & Hidi, 2020; Harackiewicz et al., 2020; Putra & Zulkardi, 2020).

One potential approach to addressing these challenges is the implementation of the *blended learning* model. This model combines face-to-face instruction with online learning, enabling a more flexible and adaptive learning experience tailored to students' needs. Previous studies have demonstrated that blended learning can enhance student engagement, independence, and academic achievement (Boelens et al., 2021; Kintu et al., 2021; Hrastinski, 2019). In the Indonesian context, blended learning has also been found to improve student activity and learning autonomy in mathematics education (Pratiwi et al., 2021; Yuliana et al., 2020; Fitriani et al., 2021).

Google Classroom, as one of the widely used Learning Management Systems (LMS), plays a significant role in supporting the implementation of blended learning due to its accessibility, efficiency in managing learning activities, and interactive features that facilitate communication between teachers and students. Its use has been shown to improve learning effectiveness and student engagement (Kintu et al., 2021; Rasheed et al., 2020; Graham, 2021). In Indonesian mathematics classrooms, Google Classroom has also demonstrated its effectiveness in enhancing interaction and enabling more flexible learning environments (Sari & Setiawan, 2021; Wicaksono et al., 2021; Hidayat & Widodo, 2020).

However, although numerous studies have examined the effectiveness of blended learning and Google Classroom, most of them focus on learning outcomes, motivation, or student satisfaction. Studies that specifically investigate students' interest in mathematics learning as the primary variable in the context of Google Classroom-based blended learning remain limited, particularly those employing a quasi-experimental design at the secondary school level in Indonesia. In fact, learning interest is a crucial affective factor that significantly influences student engagement and academic success (Renninger & Hidi, 2020; Harackiewicz et al., 2020; Putra & Zulkardi, 2020).

Based on the above considerations, a clear research gap exists in the need for empirical studies that specifically examine the effect of Google Classroom-based blended learning on students' interest in mathematics learning using a quasi-experimental design in the context of Indonesian secondary education. Therefore, this study aims to fill this gap and provide empirical contributions to the development of technology-based mathematics learning.



Blended Learning Model Diagram

B. Problem Statement

Based on the background described above, several problems can be identified in mathematics learning at MAN 1 Polewali Mandar. First, there is still low student interest in learning mathematics, which can be seen from the lack of active participation and enthusiasm during the learning process. Second, conventional learning methods that are still widely used have not been able to accommodate the needs of students in the digital era. Third, there has been no maximum utilization of technology in mathematics learning, even though the school has adequate facilities and infrastructure.

The main problem in this study is formulated as follows: "Is there a significant effect of the blended learning model based on Google Classroom on students' interest in learning mathematics at MAN 1 Polewali Mandar?"

3 Research Objectives

Based on the problem statement, the objectives of this study are:

- To determine the effect of the blended learning model based on Google Classroom on students' interest in learning mathematics.
- To compare the learning interest between students taught using the blended learning model based on Google Classroom and those taught using conventional learning models.
- To provide recommendations for teachers in implementing innovative learning models to increase student interest in learning mathematics.

4 Research Benefits

This study is expected to provide theoretical and practical benefits:

Theoretical Benefits:

- Contributing to the development of educational technology literature, especially regarding the implementation of blended learning in mathematics learning.
- Providing empirical evidence about the effectiveness of Google Classroom-based blended learning in increasing student learning interest.
- Enriching the reference for further research related to technology-based learning models.

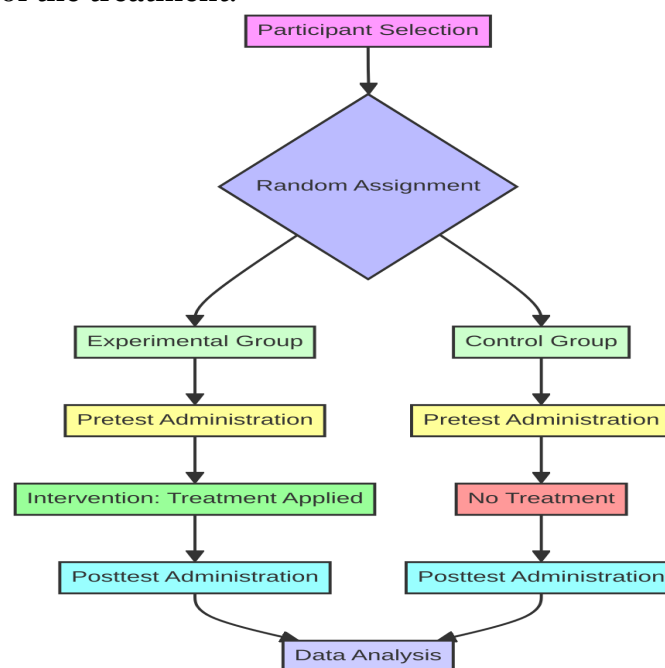
Practical Benefits:

- For teachers: providing an alternative learning model that can be applied to increase student interest in learning mathematics.
- For students: improving learning interest through more interactive and flexible learning experiences.
- For schools: providing input for developing technology-based learning strategies.
- For policymakers: becoming a reference for developing curriculum and educational technology policies.

2. Methods

2.1. Research Design

This study employed a quantitative approach using a quasi-experimental design. This design was selected because the research was conducted in a natural school setting where random assignment of participants was not feasible (Creswell & Creswell, 2018). The design applied was the pretest–posttest control group design, involving two groups: an experimental group and a control group. Both groups were given a pretest to determine their initial condition and a posttest to measure the effect of the treatment after the intervention. The experimental group received instruction using a blended learning model based on Google Classroom, while the control group was taught using conventional learning methods. The comparison of pretest and posttest results between the two groups was used to determine the effect of the treatment.



Research Design Flowchart

2.2. Population and Sample

The population of this study consisted of all students of class XI MIPA MAN 1 Polewali Mandar, comprising 4 classes with a total of 120 students.

The sampling technique used was purposive sampling, which involves selecting samples based on specific considerations (Fraenkel et al., 2019), particularly the similarity of academic ability and learning characteristics among classes.

The selected sample included:

- Class XI MIPA 1 as the experimental class (30 students)
- Class XI MIPA 2 as the control class (30 students)

2.3. Research Variables

This study involved two variables:

Independent Variable: Blended learning model based on Google Classroom, which is applied to experimental class.

Dependent Variable: Students' interest in learning mathematics, which is measured through a questionnaire.

2.4. Research Instruments

The instrument used in this study was a mathematics learning interest questionnaire developed using a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The instrument was constructed based on the theory of learning interest proposed by Krapp (2002) and supported by previous empirical studies.

The indicators measured include:

1. Attentional engagement
2. Affective engagement
3. Cognitive engagement
4. Behavioral engagement

Prior to its use, the instrument underwent both content validity and empirical validity testing. Content validity was assessed through expert judgment involving two mathematics education lecturers and two mathematics teachers to ensure the relevance and clarity of each item.

Empirical validity testing was conducted using the Pearson product-moment correlation (item-total correlation). The instrument was piloted on 26 students outside the research sample. The results showed that out of 30 items, 5 items were invalid because the correlation coefficient (r_{count}) was lower than r_{table} at a significance level of 0.05. These items were removed using the drop-out technique, resulting in 25 valid items used in the final instrument.

The reliability of the instrument was tested using the Cronbach Alpha formula, yielding a coefficient of 0.87, which indicates a high level of reliability.

2.5. Data Collection Procedure

The data collection procedure consisted of three stages:

a. Preparation Phase

- Conducting preliminary observations at the research site
- Preparing research instruments and learning materials
- Obtaining research permission from the school

b. Implementation Phase

- Administering pretest to both experimental and control groups
- Implementing blended learning based on Google Classroom in the experimental class
- Conducting conventional learning in the control class
- The treatment was carried out for 8 meetings
- Administering posttest to both groups

The blended learning implementation combined 75% face-to-face learning and 25% online learning. Face-to-face sessions focused on discussion and problem-solving activities, while online learning via Google Classroom was used for delivering materials, assignments, and supplementary learning resources.

c. Data Analysis Phase

- Scoring the questionnaire results
- Processing and analyzing data using statistical methods

2.6. Data Analysis Technique

Data analysis was conducted using descriptive and inferential statistics.

Descriptive statistics were used to describe students' learning interest, including mean, standard deviation, minimum, and maximum scores.

Inferential statistics were used to test the research hypotheses through:

- Normality test using Shapiro–Wilk
- Homogeneity test using Levene’s test
- Hypothesis testing using an independent sample t-test

All statistical analyses were performed using SPSS with a significant level of 5%.

3. Results

3.1. Descriptive Analysis

The descriptive statistics of students’ mathematics learning interest scores are presented for both pretest and posttest.

Pretest Results

Before the treatment was administered, a pretest was conducted to determine the initial equivalence between the experimental and control groups. The mean score of the experimental group was 68.33, while the control group had a mean score of 67.50. These results indicate that both groups had relatively similar initial levels of learning interest.

Post-test Results

The results of the descriptive analysis of students’ mathematics learning interest are presented in Table 1.

Table 1. Descriptive Statistics of Learning Interest Scores.

Group	N	Mean	Std. Deviation	Minimum	Maximum
Experimental	30	84.33	5.67	72	95
Control	30	72.67	6.23	60	85

After the implementation of the treatment, the posttest results showed that the experimental group achieved a higher mean score (84.33) compared to the control group (72.67). The standard deviation of the experimental group (5.67) was slightly lower than that of the control group (6.23), indicating a more homogeneous distribution of learning interest scores in the experimental class.

Furthermore, the distribution of learning interest categories revealed that 76.7% of students in the experimental class were in the high and very high categories, whereas only 33.4% of students in the control class reached these categories.

Learning Interest Comparison Chart The distribution of learning interest categories in both groups is shown in Table 2.

Table 2. Distribution of Learning Interest Categories.

Category	Experimental Class	Control Class
Very High	8 (26.7%)	2 (6.7%)
High	15 (50.0%)	8 (26.7%)
Medium	6 (20.0%)	12 (40.0%)
Low	1 (3.3%)	6 (20.0%)

Category	Experimental Class	Control Class
Very Low	0 (0%)	2 (6.7%)

From Table 2, it can be observed that 76.7% of students in the experimental class are in the high and very high categories, compared to only 33.4% in the control class.

3.2. Pretest Equivalence Testing

To ensure that both groups had equivalent initial conditions before the treatment, prerequisite tests were conducted on the pretest data.

Normality Test (Pretest)

The results of the normality test showed that the pretest data in both groups were normally distributed, with significant values greater than 0.05 .

Homogeneity Test (Pretest)

The homogeneity test results indicated that the variance of the pretest scores between the experimental and control groups was homogeneous ($p > 0.05$), meaning that both groups had similar variance characteristics.

Pretest Mean Comparison

The comparison of pretest mean scores between the two groups showed no substantial difference, indicating that both groups were statistically equivalent before the treatment.

These results confirm that any differences observed in the posttest can be attributed to the treatment rather than initial differences between groups.

3.3. Inferential Analysis (Posttest)

Before hypothesis testing, prerequisite tests were conducted to ensure that the data met the assumptions for parametric testing.

Normality Test (Posttest)

The Shapiro–Wilk test showed that the posttest data in both groups were normally distributed ($p > 0.05$).

Homogeneity Test (Posttest)

Levene’s test indicated that the variance between the experimental and control groups was homogeneous ($p = 0.503 > 0.05$) .

Hypothesis Testing

The independent sample t-test results showed that $t_{\text{count}} = 4.567 > t_{\text{table}} = 2.000$ with a significant value of $0.000 < 0.05$.

This result indicates a significant difference between the experimental and control groups. Therefore, the null hypothesis (H_0) is rejected, and the alternative hypothesis (H_1) is accepted.

The independent sample t-test results are presented in Table 3.

Table 3. Independent Sample T-Test Results Rows, 5 Columns.

Variable	t-count	t-table	Sig. (2-tailed)	Decision
Learning Interest	4.567	2.000	0.000	H_0 rejected

Based on the t-test results, $t_{\text{count}} (4.567) > t_{\text{table}} (2.000)$ with a significance value of $0.000 < 0.05$. Therefore, H_0 is rejected and H_1 is accepted, indicating that there is a

significant difference in learning interest between the experimental class and the control class.

3.4. N-Gain Analysis

To measure the effectiveness of the treatment, N-gain analysis was conducted to determine the improvement in learning interest. The N-gain calculation results are shown in Table 4.

Table 4. N-Gain Analysis Result

Group	Pretest Mean	Posttest Mean	N-Gain	Category
Experimental	68.33	84.33	0.51	Medium
Control	67.50	72.67	0.16	Low

The N-gain analysis shows that the experimental class experienced a medium improvement (0.51), while the control class only experienced a low improvement (0.16).

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References

- Boelens, R., De Wever, B., & Voet, M. (2021). Four key challenges to the design of blended learning: A systematic literature review. *Educational Research Review*, 22, 1–18. <https://doi.org/10.1016/j.edurev.2017.06.001>
- Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). Sage Publications.
- Dhawan, S. (2020). Online learning: A panacea in the time of COVID-19 crisis. *Journal of Educational Technology Systems*, 49(1), 5–22. <https://doi.org/10.1177/0047239520934018>
- Fitriani, Y., Bandung, M., & Kadarisma, G. (2021). Pengaruh pembelajaran daring terhadap aktivitas belajar matematika siswa. *Jurnal Cendekia: Jurnal Pendidikan Matematika*, 5(2), 1500–1510.
- Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2019). *How to design and evaluate research in education* (9th ed.). McGraw-Hill Education.
- Garrison, D. R., & Vaughan, N. D. (2008). *Blended learning in higher education: Framework, principles, and guidelines*. John Wiley & Sons.
- Harackiewicz, J. M., Smith, J. L., & Priniski, S. J. (2020). Interest matters: The importance of promoting interest in education. *Policy Insights from the Behavioral and Brain Sciences*, 3(2), 220–227. <https://doi.org/10.1177/2372732218785540>
- Hidayat, W., & Widodo, S. A. (2020). Pengaruh penggunaan teknologi dalam pembelajaran matematika. *Jurnal Elemen*, 6(2), 213–225.

- Hodges, C., Moore, S., Lockee, B., Trust, T., & Bond, A. (2020). The difference between emergency remote teaching and online learning. *Educause Review*.
- Hrastinski, S. (2019). What do we mean by blended learning? *TechTrends*, 63(5), 564–569. <https://doi.org/10.1007/s11528-019-00375-5>
- Kaiser, G., & Stender, P. (2022). Mathematical modelling in education. *ZDM Mathematics Education*, 54, 1–14. <https://doi.org/10.1007/s11858-021-01276-2>
- Kintu, M. J., Zhu, C., & Kagambe, E. (2021). Blended learning effectiveness: The relationship between student characteristics, design features, and outcomes. *International Journal of Educational Technology in Higher Education*, 18(1), 1–20. <https://doi.org/10.1186/s41239-021-00259-8>
- Krapp, A. (2002). Structural and dynamic aspects of interest development: Theoretical considerations from an ontogenetic perspective. *Learning and Instruction*, 12(4), 383–409. [https://doi.org/10.1016/S0959-4752\(01\)00011-1](https://doi.org/10.1016/S0959-4752(01)00011-1)
- Nurfadilah, S., Kusnandi, K., & Herman, T. (2021). Analisis minat belajar matematika siswa. *Jurnal Riset Pendidikan Matematika*, 8(1), 45–56.
- Pratiwi, D. D., Widyastuti, I., & Handayani, S. (2021). Blended learning dalam meningkatkan kemandirian belajar siswa. *Jurnal Pendidikan Matematika*, 15(1), 67–78.
- Putra, R. W. Y., & Zulkardi. (2020). Students' interest in mathematics learning and its influencing factors. *Jurnal Pendidikan Matematika*, 14(1), 25–36.
- Rasheed, R. A., Kamsin, A., & Abdullah, N. A. (2020). Challenges in the online learning environment: A systematic review. *Computers & Education*, 144, 103701. <https://doi.org/10.1016/j.compedu.2019.103701>
- Renninger, K. A., & Hidi, S. (2020). *The power of interest for motivation and engagement*. Routledge.
- Sari, R. N., & Setiawan, W. (2021). Efektivitas Google Classroom dalam pembelajaran matematika. *Jurnal Elemen*, 7(1), 112–125.
- Verschaffel, L., Depaepe, F., & Van Dooren, W. (2020). Word problems in mathematics education. *ZDM Mathematics Education*, 52, 1–16. <https://doi.org/10.1007/s11858-020-01130-4>
- Wicaksono, A., Kusumah, Y. S., & Sumarmo, U. (2021). Penggunaan learning management system dalam pembelajaran matematika. *Jurnal Riset Pendidikan Matematika*, 8(2), 210–220.
- Yuliana, Y., Kartono, K., & Mariani, S. (2020). Pengaruh blended learning terhadap hasil belajar matematika. *Kreano: Jurnal Matematika Kreatif-Inovatif*, 11(2), 143–152.