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Google Sites-Assisted Discovery Learning in Primary Mathematics and Its Effect on Students' Problem-Solving Ability in Factors and Multiples

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Abstract: This study aims to examine students' mathematical problem-solving skills and determine the effect and contribution of implementing the Discovery Learning model supported by Google Sites on the topics of Greatest Common Divisor (GCD) and Least Common Multiple (LCM) among fourth-grade students at SDN 2 Jampiroso. This research employed a quantitative quasi-experimental method using a non-equivalent control group design, involving 25 students in the experimental class and 28 students in the control class. The research instruments consisted of descriptive problem-solving tests (pretest and posttest) that had been validated and tested for reliability, as well as a problem-solving ability questionnaire. Data analysis was conducted using normality tests, homogeneity tests, the Independent Samples t-test, and N-Gain analysis with the assistance of SPSS version 27. The results showed that students in the experimental class achieved higher problem-solving skills than those in the control class, with mean posttest scores of 79.33 and 71.54, respectively. The t-test results indicated a calculated t-value of 2.198, which exceeded the critical t-value of 2.007 (df = 51). Furthermore, the significance value (two-tailed) was 0.033 < 0.05, indicating a statistically significant difference between the two groups. The N-Gain score of 56.71% was categorized as moderate, indicating that the implemented learning model had a moderate level of effectiveness. This finding was supported by the questionnaire results, which obtained an average score of 83.31, categorized as very good. Therefore, the Discovery Learning model supported by Google Sites effectively enhances students' mathematical problem-solving skills and provides a more interactive, technology-integrated learning experience that can support teachers and curriculum developers in the digital era.

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Introduction

Education has a crucial role for every individual to develop academic and non-academic skills and to build character. To fulfill the requirements of the 21st-century era, the National Education Association and the Partnership for 21st Century Learning (P21) emphasize four key skills (the 4Cs): critical thinking, creativity, communication, and collaboration. One of the most important skills is critical thinking, which helps students evaluate the accuracy of the information they receive and solve problems (Fajriyah, 2022).

One of the subjects that plays a role in developing these skills is mathematics, particularly in fostering problem-solving skills (Firdaus & Putra, 2022). According to Hermawati (2020), every student needs to receive mathematics instruction at the elementary school level so that they can think critically, systematically, logically, and analytically, as well as develop collaborative skills. However, in reality, students' understanding of

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mathematics remains relatively low, particularly regarding mathematical problem-solving skills, necessitating improvements in the learning process.

The National Council of Teachers of Mathematics (NCTM) emphasizes that mathematics education encompasses five key competencies problem solving, reasoning and proof, communication, connections, and representation (Mauleto, 2019), as cited in Riyanto & Amidi (2024). Of these five competencies, problem solving is an essential skill that must be developed. However, Indonesian students still demonstrate relatively low problem solving skills, partly due to a lack of opportunities for students to practice independently (Riyanti & Amidi, 2024).

According to Cahyani et al. (2022), Trends in International Mathematics and Science Study (TIMSS) findings reveal that students' problem-solving skills remain low, as evidenced by suboptimal mathematics learning outcomes. Meanwhile, (Hamzah & Dahlan, 2023) state that Indonesian students' mathematics performance on the TIMSS from 2003 to 2015 remained below the international average and showed a declining trend. The findings of the Programme for International Student Assessment (PISA) 2022 show that Indonesia ranked 63rd among 81 countries with a rating of 366, down from 2015 (386) and 2018 (379), and still far below Singapore (575), China (552), and Japan (536). This indicates that Indonesian students' mathematical problem-solving skills remain low (Faiq & Wijayanti, 2024).

Mathematical problem-solving is a key competence that students are required to master, as these skills are not only used to solve math problems but also in everyday life. (Firdaus & Putra, 2022). Students are not only expected to obtain answers but also to be able to use appropriate strategies in accordance with the stages of problem-solving as proposed by Polya cited in Purba et al. (2021) and Nurhayati et al. (2022). Therefore, the low level of problem-solving skills needs to be addressed immediately.

Issues related to mathematical problem-solving skills were identified at SDN 4 Purbowangi. Based on the results of observations and interviews conducted by Firdaus & Putra (2022), in the mathematics learning process, teachers still face challenges to enhance students' abilities to solve mathematical problems regarding the concepts of the Greatest Common Factor (GCF) and the Least Common Multiple (LCM). Additionally, the implementation of learning media remains less than optimal, resulting in students being less actively engaged and tending to be passive.

This situation is relevant to SDN 1 Jampiroso and SDN 2 Jampiroso, which face similar challenges in mathematics instruction. Both schools struggle with solving mathematical problems, particularly regarding GCF and LCM, primarily because instruction remains dominated by lecture-based methods and assignment-giving, and has not yet utilized innovative media, resulting in students being less active. Furthermore, students perceive mathematics as difficult and boring and have low motivation to learn. Regarding GCF and LCM, students also struggle to understand problems and determine solution steps, necessitating instructional innovations to enhance students' problem-solving skills. Therefore, the findings reported by Firdaus & Putra (2022) provide a relevant context for understanding the learning challenges occurring at SDN 1 Jampiroso and SDN 2 Jampiroso.

One approach that can be implemented is the Discovery Learning model. (Isnanda et al., 2024) explain that this model encourages students to make observations and conduct experiments until they are able to draw conclusions. Faizun et al. (2025) added that Discovery Learning provides students with the opportunity to actively seek and process information. Furthermore, the use of Google Sites is effective because it is flexible and

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interactive (Ferismayanti, 2021). Previous research has shown that Discovery Learning can improve students' learning outcomes, motivation, and critical thinking skills, while Google Sites provides a flexible and interactive digital learning environment. However, these studies generally examined Discovery Learning and Google Sites separately and have not specifically focused on mathematical problem-solving skills regarding GCD and LCM concepts at the elementary school level, specifically in fourth grade. Therefore, further research is needed to examine how the combination of Discovery Learning and Google Sites can improve elementary students' mathematical problem-solving skills while addressing the need for technology-based learning in the digital age.

This study aims to examine the effect and contribution of implementing the Discovery Learning model supported by Google Sites to fourth-grade elementary school students' mastery of GCD and LCM concepts and their mathematical problem-solving skills. This study presents a novelty by applying the Discovery Learning model in conjunction with Google Sites. Previous research has shown that Discovery Learning improves learning outcomes, but generally still uses audiovisual media or interactive books (Nisa et al., 2024). Utilizing Google Sites as a learning medium provides systematic and interactive presentation features, such as teaching materials, learning videos, and other educational games. However, studies related to the application of this model to GCD and LCM materials in elementary schools are still limited, and not many specifically examine skills in solving mathematical problems. Thus, Discovery Learning implementation aided by Google Sites is expected to contribute to mathematics learning in elementary schools, particularly in improving fourth-grade students' GCD and LCM problem-solving skills through more engaging, interactive, and effective learning.

Research Method

This study uses a quantitative approach with a quasi-experimental design. According to Creswell (2015) as cited in (Saputri et al., 2024), a quasi-experimental design is an experimental design that does not involve randomization in the formation of groups, yet participants are still assigned to specific groups. The design applied is a non-equivalent control group design, which involves pre-test and post-test measurements in both groups, experimental and control. The experimental class received instruction through Discovery Learning assisted by Google Sites, in contrast, the control class received conventional teaching. The treatment was administered over three sessions. The following is the structure of the non-equivalent control group design (Sugiyono, 2018)

Table 1. Non-Equivalent Control Group Design

O1	**X**	**02**
O3		**04**

Description:

O1 : Experimental group before treatment (4th grade, SD 2 Jampiroso)
O2 : Experimental group after treatment (4th grade, SD 2 Jampiroso)
X : Treatment use of the Discovery Learning model supported by Google Sites
O3 : Control group before treatment (4th grade, SD 1 Jampiroso)
O4 : Control group not given the treatment (4th grade, SD 1 Jampiroso)

The method used in this study was probability sampling with a cluster sampling technique that ensures equal selection opportunities available to all population members (Sugiyono, 2020). The research sample consisted of 28 fourth-grade students from SDN 1 Jampiroso as the control group and 25 fourth-grade students from SDN 2 Jampiroso as the

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experimental group. Both schools were selected because they had relatively homogeneous academic characteristics according to information provided by the classroom teachers, including the implementation of the same curriculum, comparable student backgrounds, and relatively equivalent levels of achievement in mathematics. Data collection techniques included observation, interviews, tests, and questionnaires. Observations and interviews were used to obtain information regarding the implementation of instruction, while tests in the form of essay questions (pretest and posttest) were used to assess students' cognitive abilities on the topics of GCD and LCM. The questionnaire was designed using a 1–4 Likert scale to measure students' problem-solving abilities.

The research instruments underwent validity and reliability testing prior to use. Data analysis was conducted using normality and homogeneity tests as prerequisites, To analyze differences in average learning achievement, an independent sample t-test was applied to the experimental and control classes. Additionally, the improvement in students' problem-solving abilities was analyzed by calculating the N-gain from pretest and posttest assessment result by means of the following formula:

$$\text{N gain} = \frac{\text{posttest score} - \text{pretest score}}{\text{ideal score} - \text{pretest score}}$$

The calculation results were then classified according to the following established criteria:

Table 2. N-Gain Value Categories

N-Gain Value	Category
N-gain > 0,7	High
0,3 ≤ N-gain ≤ 0,7	Moderate
N-gain < 0,3	Low

(Sukarelawa et al., 2024)

Results and Discussion

Instruction in the class that received the experimental group was conducted over three sessions. The Discovery Learning model approach with Google Sites was implemented in the experimental class, whereas the control group applied conventional instruction with a simple PowerPoint presentation. In the experimental class, each session covered different material, namely factors and multiples of numbers, prime numbers and prime factorization, as well as GCF and LCM. During the lessons, students utilized various Google Sites features such as animated videos, educational games, number tables, and other interactive features. The use of these media encouraged student engagement and active participation in the learning process.

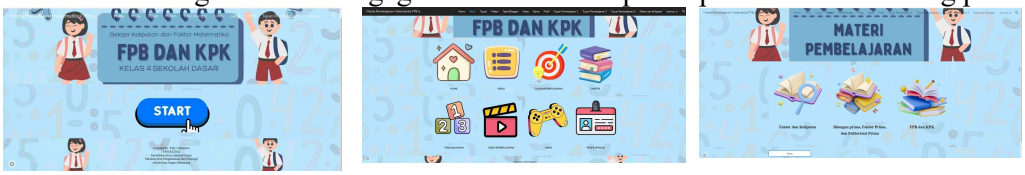

Figure 1. Google Sites Learning Resources
https://sites.google.com/students.unnes.ac.id/media-pembelajaran-matematika-/home

Before and after the three-session instruction, students were administered pretests and posttests with essay-type questions on the topics of GCF and LCM to measure their initial and final abilities in mathematical problem-solving. The outcomes of the validity test showed that the six open-ended questions were deemed valid with a significance level of < 0.05. Meanwhile, the reliability test results yielded a Cronbach's Alpha value of 0.895, which falls

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within the very high criterion, so the instruments were deemed reliable. Subsequently, the pretest and posttest data were analyzed using statistical tests with the aid of SPSS version 27 and presented descriptively to illustrate the distribution of scores in both classes.

Table 3. Pretest and Posttest Data

No	Description	Experiment		Control	
		Pretest	Posttest	Pretest	Posttest
1.	Number of students	25	25	28	28
2.	Highest score	80	100	66,67	96,67
3.	Lowest value	40	60	36,67	46,67
4.	Mean	55,60	79,33	51,07	71,54

The research data indicate that students' initial competence in both classes had not yet reached the Minimum Passing Score (MPS) of 75. In the pretest, the control class, consisting of 28 students, scored a low of 36.67 and a high of 66.67, with an average of 51.07, while the experimental class, consisting of 25 students, scored a low of 40 and a high of 80, with an average of 55.60. This reflects that most students in both classes had not attained the established proficiency level.

After the instructional intervention, the posttest results showed improvement in both classes, with a greater increase in the experimental class. The control class attained a lowest posttest score of 46.67 and a highest score of 96.67, with a mean score of 71.54, while the experimental class achieved a lowest posttest score of 60 and top score of 100, with an average of 79.33. The experimental class's average had already exceeded the Minimum Passing Score (MPS), showing that most learners had reached mastery of the subject matter.

Normality Tests for Pretest and Posttest Data from the Experimental and Control Classes

Before testing the hypotheses, Initially, prerequisite testing was conducted, consisting of normality and homogeneity analyses. In this study, it was applied to both pretest and posttest outcome of the experimental and control classes. The method used for the data normality test was the Shapiro-Wilk test using SPSS version 27 software.

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Kelas	Statistic	df	Sig.	Statistic	df	Sig.
Hasil	Pretest A (Kontrol)	.120	28	.200*	.946	28	.155
	Posttest A (Kontrol)	.114	28	.200*	.959	28	.330
	Pretest B (Eksperimen)	.152	25	.140	.928	25	.077
	Posttest B (Eksperimen)	.111	25	.200*	.959	25	.393

*. This is a lower bound of the true significance.
a. Lilliefors Significance Correction

Figure 2. Results of the Normality Tests for the Pretest and Posttest of the Experimental and Control Classes

From the Shapiro–Wilk test results, the control group obtained a significance value of 0.155 for the pretest and 0.330 for the posttest, while for the experimental class, the significance values were 0.077 for the pretest and 0.393 for the posttest. All of these values were > 0.05, so the data were deemed to be normally distributed. Therefore, the null hypothesis (H_o) was accepted and the alternative hypothesis (H_a) was rejected, meaning the data were suitable for further testing.

Test of Homogeneity of Pretest and Posttest Data for the Experimental and Control Classes

In this study, the test of homogeneity was performed using Lavene's Test with SPSS version 27.

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Test of Homogeneity of Variance

		Levene Statistic	df1	df2	Sig.
Hasil	Based on Mean	3.810	1	51	.056
	Based on Median	3.561	1	51	.065
	Based on Median and with adjusted df	3.561	1	47.680	.065
	Based on trimmed mean	3.867	1	51	.055

Figure 3. Results of the Homogeneity Test for Pretest Data from the Experimental and Control Classes

The test results yielded a pretest significance value of 0.056 (> 0.05), so (H_o) was accepted and (H_a) was rejected, indicating that the variances of the experimental and control classes are homogeneous and meet the requirements for further testing.

Test of Homogeneity of Variance

		Levene Statistic	df1	df2	Sig.
Hasil	Based on Mean	.473	1	51	.495
	Based on Median	.400	1	51	.530
	Based on Median and with adjusted df	.400	1	47.138	.530
	Based on trimmed mean	.471	1	51	.496

Figure 4. Results of the Homogeneity Test for Posttest Data from the Experimental and Control Classes

The results of the posttest homogeneity test showed a significance value of 0.495 (> 0.05); it can be concluded that (H_o) is accepted and (H_a) is rejected. Thus, the variances of the experimental and control classes are declared homogeneous and meet the requirements for further testing.

Hypothesis Testing (t-Test)

The t-test is used to examine whether a significant difference exists between two groups of data, namely GCD and LCM problem-solving, via the Discovery Learning model combined with Google Sites. This test used an Independent Samples T-Test with SPSS version 27 software.

Group Statistics

	Kelas	N	Mean	Std. Deviation	Std. Error Mean
Nilai	Posttest_Kontrol	28	71.5482	13.98046	2.64206
	Posttest_Eksperimen	25	79.3340	11.50704	2.30141

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Nilai	Equal variances assumed	.473	.495	-2.198	51	.033	-7.78579	3.54294	-14.89854	-.67303
	Equal variances not assumed			-2.222	50.688	.031	-7.78579	3.50385	-14.82111	-.75046

Figure 5. Results of the t-Test

The t-test results indicate a calculated t-value of 2.198, while the critical t-value (df = 51) is 2.007. It can be concluded that the calculated t-value is greater than the critical t-value (2.198 > 2.007). Additionally, the significance level (two-tailed) shown in the table above is 0.033 < 0.05. The results indicate that (H_o) is rejected while (H_a) is accepted, confirming a significant influence of Discovery Learning supported by Google Sites on fourth-grade students' GCD and LCM problem-solving skills.

N-Gain Test

The N-Gain test aims to find out the magnitude of the an improvement in scores between the pretest and posttest data for the experimental and control groups, as well as to assess the contribution of the treatment administered using SPSS version 27.

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Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
NGain_Score	28	-.45	.93	.4011	.32473
NGain_Persen	28	-45.43	93.34	40.1135	32.47257
Valid N (listwise)	28				

Figure 6. Results of the N Gain Test for the Control Class

Based on the descriptive statistics, the control class achieved an N-Gain value of 0.4011, which is classified as a moderate level. When expressed as a percentage (N-Gain Percent), the average increase in learning outcomes reached 40.11%, indicating that conventional teaching is less able to improve students' skills in solving problems regarding GCD and LCM concepts.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
NGain_Score	25	.29	1.00	.5671	.18420
NGain_Persen	25	29.42	100.00	56.7100	18.41992
Valid N (listwise)	25				

Figure 7. Results of the N-Gain Test for the Experimental Class

Based on the descriptive statistics table, the n-gain index score for the experimental class was 0.5671, which falls into the moderate category. When expressed as a percentage (N-Gain Percent), the average increase in learning outcomes reached 56.71%. This indicates that the implementation of the Discovery Learning model supported combined with Sites was sufficiently successful in improving students' problem-solving abilities regarding GCD and LCM material.

Descriptive Statistics

	N	Range	Minimum	Maximum	Mean	Std. Deviation
Pretest Kontrol	28	30.00	36.67	66.67	51.0711	9.25396
Posttest Kontrol	28	50.00	46.67	96.67	71.5482	13.98046
Valid N (listwise)	28					

Figure 8. Average Pretest and Posttest Scores for the Control Group

Descriptive statistical analysis shows that the control class, consisting of 28 students, achieved a mean pretest score of 51.0711, with the lowest value of 36.67 and highest value of 66.67. The mean posttest score increased to 71.5482, with a lowest score of 46.67 and a highest score of 96.67. The difference between the average pretest and posttest scores was 20.47.

Descriptive Statistics

	N	Range	Minimum	Maximum	Mean	Std. Deviation
Pretest Eksperimen	25	40.00	40.00	80.00	55.6004	12.57319
Posttest Eksperimen	25	40.00	60.00	100.00	79.3340	11.50704
Valid N (listwise)	25					

Figure 9. Average Pretest and Posttest Scores for the Experimental Class

In accordance with the results of descriptive statistical analysis, the experimental class consisting of 25 students obtained a pretest mean of 55.6004, with the lowest value of 40 and the highest value of 80. After implementing the Discovery Learning model supported by Google media, the mean posttest score rose to 79.3340, ranging from a minimum of 60 to a maximum of 100, with an average difference of 23.7336 between pretest and posttest scores. In the meantime, the control class showed an improvement of 20.47. This shows that the improvement in learning outcomes was greater in the experimental class, suggesting that the intervention resulted in improved student learning outcomes in a more positive way.

Questionnaire on Improving Problem-Solving Skills for GCD and LCM

A problem-solving skills questionnaire was administered to students in the experimental class after being taught using the Discovery Learning approach supported by

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Google Sites as supplementary data. The instrument included 13 statements rated on a Likert scale covering values from 1- 4.

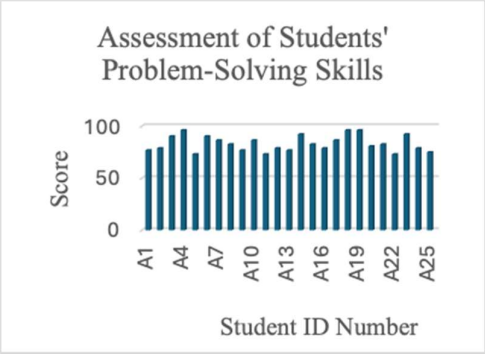

Figure 10. Results of the Assessment of Students' Problem-Solving Skills

The results showed that the students' problem-solving skills were in the "very good" a category with a mean score of 83.31, with most scores above 75 (the highest being 96.15 and the lowest 73.08). This indicates that the implementation of this model was able to improve students' understanding of the concepts of GCD and LCM as well as their problem-solving skills.

Discussion

Description of Fourth-Grade Students' Problem-Solving Skills in GCD and LCM as Viewed Through the Application of the Discovery Learning Model Assisted by Google Sites

In the pretest results, the experimental class achieved a mean score of 55.60, and the control class (51.07), indicating that students' initial problem-solving skills were still low. As assessed by Polya's problem-solving indicators, as cited in (Purba et al., 2021), students faced difficulties at every stage, including understanding the problem, planning a solution, executing solution steps, and verifying the answer. This indicates that students' problem-solving skills have not yet developed optimally or systematically. In line with this, (Khaza Ilfa et al., 2023) indicated that students' problem-solving skills at the initial stage were still relatively low. (Listiawani et al., 2024) stated that students still struggled to formulate solution steps systematically.

After the intervention, the posttest results showed that both classes improved, with the experimental class's average (79.33) being higher than the control class's (71.54). Most students in the experimental class had achieved the minimum passing score, whereas the improvement in the control class was not as significant as that of the experimental class. This indicates that the implementation of the Discovery Learning model aided by Google Sites is more effective than conventional learning.

The higher average score of 79.33 achieved by the experimental group can be linked to the integration of the Discovery Learning model and Google Sites. The animated videos and interactive learning materials available on Google Sites help students better understand the concepts of GCD and LCM, thereby supporting the first stage of problem-solving according to Polya, namely understanding the problem. Through Discovery Learning activities, students are encouraged to explore information, identify patterns, and formulate problem-solving strategies, which supports the planning stage. Additionally, educational games and interactive exercises provide students with the opportunity to apply and test the strategies they designed during the planning stage. Finally, feedback obtained through discussions and learning activities helps students review and evaluate the solutions they have

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obtained, which aligns with the reflection stage. This learning experience contributes to the improvement of students' mathematical problem-solving skills. These results suggest that problem-solving skills developed in a more organized and structured manner. Research (Nisa et al., 2024) also supports this finding, suggesting that Discovery Learning supported by interactive media can significantly enhance problem-solving skills.

Additionally, survey results showed a mean score of 83.31 in the "very good" category, suggesting that implementing Discovery Learning with Google Sites assistance positively influences students' problem-solving ability. This improvement aligns with Bruner's theory, which emphasizes active and independent learning. These findings are further supported by (Listiawani et al., 2024), who state that Discovery Learning influences students' problem-solving skills. Furthermore, technology-based instructional media can increase student participation and learning interest (Mashudi et al., 2023). Other research findings indicate that digital media influences improvements in students' learning achievement (Setiawan et al., 2024).

The Effect of Implementing the Discovery Learning Model Using Google Sites on Problem-Solving Skills

The study results indicate that implementing Discovery Learning with Google Sites assistance significantly improves the abilities of fourth-grade students at SDN 2 Jampiroso in solving problems involving the GCD and LCM. From the normality test results, the pretest and posttest data of both classes had a normal distribution with a significance value > 0.05. Furthermore, the homogeneity test indicated that the two classes had homogeneous variances, both in the pretest data (0.056 > 0.05) and posttest data (0.495 > 0.05), therefore, the data met the criteria needed for hypothesis testing.

Hypothesis testing using an independent samples t-test revealed a significance value (Sig. 2-tailed) of 0.033 < 0.05, so (H_o) was rejected and (H_a) was accepted. This shows that applying the Discovery Learning model assisted by Google Sites significantly influences fourth-grade students' abilities to solve problems related to GCD and LCM. Furthermore, the experimental class showed a greater average improvement in learning outcomes compared to the control class, indicating that the model demonstrates greater effectiveness than conventional learning. These findings align with previous research, specifically the study by (Hidayati & Wulandari, 2024), which explains that the use of Google Sites-based media has a significant impact on students' learning achievements. Furthermore, (Syamsuri et al., 2023) also stated that Discovery Learning effectively improves students' skills in solving problems. These findings are also supported by research by (Fry et al., 2025), which emphasizes that discovery-based learning can increase students' active engagement and foster student-centered learning.

The Contribution of Implementing the Discovery Learning Model Using Google Sites to Problem-Solving Skills

The extent of the contribution of implementing the Discovery Learning model using Google Sites to students' problem-solving skills was assessed using the N-Gain test. The calculation. The findings indicated that the experimental class achieved an average N-Gain of 0.5671 or 56.71%, which is considered to be in the moderate level and is considered moderately effective. Meanwhile, the average N-Gain value in the control class was 0.4011 or 40.11%, which also falls into the moderate category but is considered less effective. These results indicate that students who received the experimental treatment achieved better gains in problem-solving skills relative to those assigned to the control group. Therefore, the Discovery Learning model supported by Google Sites contributed 56.71% to improving

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students' problem-solving skills regarding the GCD and LCM, which is placed in the moderately effective range.

These findings are in line with previous research conducted by (Agustin et al., 2024), which explains that Discovery Learning helps improve students' ability to solve problems systematically. Additionally, research by (Hidayati & Wulandari, 2024) also shows that the use of Google Sites not only improves student learning outcomes and also receives a very positive response from students. These research findings are also backed up by (Weinhandl et al., 2025), who emphasize that a digital-based mathematics learning environment can foster student engagement and facilitate conceptual understanding. Therefore, the Discovery Learning model supported by Google Sites contributes quite effectively to improving students' problem-solving skills regarding the GCD and LCM, as evidenced by the increase in N-Gain learning outcomes and the very positive student responses based on the questionnaire results.

The findings of this study indicate that Discovery Learning supported by Google Sites can be an effective alternative for creating interactive, student-centered mathematics instruction in elementary schools. This approach provides practical guidance for mathematics teachers on integrating digital technology into instruction and supports efforts toward digital transformation in education. Theoretically, the outcomes of this research reinforce the view that technology-based learning environments can enhance the effectiveness of Discovery Learning by facilitating active exploration, student engagement, and problem-solving processes. Therefore, this study contributes to the development of research on the integration of discovery-based learning and digital technology in mathematics education.

Conclusion

The research outcomes reveal that Discovery Learning integrated with Google Sites contributes to improving elementary school students' mathematical problem-solving skills regarding the GCD and LCM concepts. The integration of discovery-based learning and digital technology encourages students to actively explore concepts, develop solution strategies, and solve problems systematically in accordance with Polya's problem-solving stages. The research findings show that Discovery Learning facilitated by Google Sites can serve as an effective and interactive approach to mathematics instruction while also supporting the integration of technology in elementary education.

Recommendation

Based on the research findings outlined above, teachers are recommended to implement the Discovery Learning model using Google Sites to enhance students' problem-solving skills and create interactive learning experiences. Schools are encouraged to provide support by supplying the necessary facilities and offering training in the use of technology. Future researchers should expand the scope of this study to include different subject matter, educational levels, and a wider range of variables, and also integrating the Discovery Learning model with other media to obtain more comprehensive results.

References

Agustin, A. P., Sabandar, J., & Novtiar, C. (2024). Meningkatkan Kemampuan Pemecahan Maslah Matematis Siswa SMP IT Al-Islamy Kelas VII Melalui Model Discovery Learning Berbantuan Video Animasi. *Jurnal Pembelajaran Matematika Inovatif*, *7*(4). https://doi.org/10.22460/jpmi.v7i4.24626

Vol. 13 No. 3 : July 2026
E-ISSN: 2722-4627
pp. 1153-1164

Cahyani, L. N., Shodiq, L. J., & Agustin, D. R. (2022). Kemampuan Literasi Matematika Siswa dalam Memecahkan Soal TIMMS Konten Aljabar Ditinjau dari Pengetahuan Metakognitif. *Journal Focus Action of Research Mathematic (Factor M)*, *5*(1), 31–51. https://doi.org/10.30762/f_m.v5i1.646

Faiq, W. A. A., & Wijayanti, P. (2024). Analisis Kemampuan Pemecahan Masalah Matematika pada Soal PISA Ditinjau dari Minat Siswa SMP terhadap Matematika. *MATH LOCUS: Jurnal Riset Dan Inovasi Pendidikan Matematika*, *5*(2), 66–78.

Faizun, M., Subhanadri, & Guswita, R. (2025). Penerapan Model Discovery Learning Untuk Meningkatkan Keterampilan Berpikir Kritis. *Jurnal Penelitian Pendidikan*, *1*(2), 113–121. https://doi.org/10.58740/jpp.v1i2.530

Fajriyah, E. (2022). Kemampuan Literasi Numerasi SiswaPada Pembelajaran Matematika Di Abad 21. *Seminar Nasional Pendidikan, FKIP UNMA*, 403–409.

Ferismayanti. (2021). Mengoptimalkan Pemanfaatan Google Sites dalam Pembelajaran Jarak Jauh. *Jurnal Inovasi Pendidikan IPA*, *5*(1), 1.

Firdaus, M. V., & Putra, L. V. (2022). PENGARUH MODEL REALISTIC MATHEMAC EDUCATION BERBANTUAN CONGKLAK TERHADAP KEMAMPUAN PEMECAHAN MASALAH SISWA MATERI KPK DAN FPB SD NEGERI 4 PURBOWANGI. *Jurnal Pendidikan Dan Sastra Inggris*, *2*(2), 2827–8860. https://ejurnal.politeknikpratama.ac.id/index.php

Fry, K., Nakar, S., & Zorn, K. (2025). Professional learning interventions for inquiry-based pedagogies in primary classrooms: A scoping review. *Mathematics Education Research Journal*, *37*(4), 853–887. https://doi.org/10.1007/s13394-024-00516-x

Hamzah, A. M., & Dahlan, T. J. A. (2023). Trends in International Mathematics and Science Study (TIMSS) as A Measurement for Students' Mathematics Assessment Development Trends in International Mathematics and Science Study (TIMSS) sebagai Tolak Ukur Pengembangan Asesmen Matematika Siswa. *Waiheru*, *9*(2).

Hermawati, F. A. (2020). *Keaktifan Model Pembelajaran Quantum Teaching Berbantuan Media Papan Pelani Terhadap Hasil Belajar Matematika Siswa Kelas IV SDN Gugus Ikan Mas Kecamatan Semarang Utara*. Universitas Negeri Semarang.

Hidayati, W. A. K., & Wulandari, R. (2024). Pengaruh Media Pembelajaran Geometri Bangun Ruang Berbasis Google Sites Terhadap Hasil Belajar Kelas V. *Journal of Education for All*, *2*(3), 162–172. https://doi.org/10.61692/edufa.v2i3.161

Isnanda, A. N., Handayani, A. D., Sulistyono, B. A., & Choiruddin. (2024). Penerapan Model Pembelajaran Discovery Learning Untuk Meningkatkan Hasil Belajar Dan Motivasi Siswa Mata Pelajaran Matematika 106. *JIPSKi: Jurnal Ilmu Pendidikan Dan Studi Keislaman*, *2*(1), 105–116. https://ejournal.stai-mas.ac.id/index.php/jipski

Khaza Ilfa, M., Dwi Ardianti, S., & Kuryanto, M. S. (2023). PENGARUH DISCOVERY LEARNING BERBANTUAN MEDIA AUDIOVISUAL TERHADAP PENINGKATAN KEMAMPUAN PEMECAHAN MASALAH MATEMATIKA. *Jurnal Pendidikan Dan Riset Matematika*, *6*(1), 2656–4181. https://ejurnal.uibu.ac.id/index.php/prismatika

Listiawani, Z., Risnawati, & Fikri Hamdani, M. (2024). Pengaruh Model Guided Discovery Learning Terhadap Pemecahan Masalah Matematis dan Motivasi Belajar Matematika Siswa Kelas V Sekolah Dasar. *Journal of Primary Education*, *7*(2), 176–184.

Mashudi, M. R., Sahra, R. N. A., Ridanti, R. A., & Marini, A. (2023). PERAN MEDIA PEMBELAJARAN INTERAKTIF BERBASIS GOOGLE SITE UNTUK

Vol. 13 No. 3 : July 2026
E-ISSN: 2722-4627
pp. 1153-1164

MENINGKATKAN HASIL BELAJAR PESERTA DIDIK SEKOLAH DASAR. *JPDSH Jurnal Pendidikan Dasar Dan Sosial Humaniora*, *2*(8). https://bajangjournal.com/index.php/JPDSH

Nisa, S. D., Febrianti, F. A., Asyari, L., Mutaqin, E. J., & Adiredja, R. K. (2024). PENGARUH MODEL PEMBELAJARAN DISCOVERY LEARNING BERBANTUAN MEDIA POP UP BOOK TERHADAP KEMAMPUAN PEMECAHAN MASALAH MATEMATIKA. *CaXra: Jurnal Pendidikan Sekolah Dasar*, *04*(02), 124–132.

Nurhayati, N., Subanji, & Rahardjo, S. (2022). Proses Pemecahan Masalah Sistem Persamaan Linear Dua Variabel Berdasarkan Tahapan Mason Ditinjau dari Tipe Adversity Quotient. *Jurnal Cendekia: Jurnal Pendidikan Matematika*, *06*(01), 615–634.

Purba, D., Zulfadil, & Lubis, R. (2021). PEMIKIRAN GEORGE POLYA TENTANG PEMECAHAN MASALAH. *Jurnal MathEdu (Mathematic Education Journal)*, *4*(1). http://journal.ipts.ac.id/index.php/

Riyanto, N. A., & Amidi. (2024). Kemampuan Pemecahan Masalah Matematis dalam Model Pembelajaran Connecting, Organizing, Reflecting, Extending (CORE). *PRISMA*, *7*, 261–267. https://journal.unnes.ac.id/sju/index.php/prisma/

Saputri, N. A., Purwanti, K. Y., & Putra, L. V. (2024). Pengaruh Model Discovery Learning Berbantuan Media Video Interaktif terhadap Kemampuan Pemahaman Konsep Siswa SD. *Jurnal Basicedu*, *8*(4), 3017–3025. https://doi.org/10.31004/basicedu.v8i4.8285

Setiawan, M. A., Sriadhi, & Silaban, S. (2024). Development E-LKPD Based Guided Inquiry Using Google Sites for Elementary School Students. *Proceedings of the 9th Annual International Seminar on Transformative Education and Educational Leadership, AISTEEL*. https://doi.org/10.4108/eai.24-9-2024.2353276

Sugiyono. (2018). *Metode Penelitian Kuantitatif, Kualitatif, R&D*. Alfabeta.

Sugiyono. (2020). *Metode Penelitian Kuantitatif, Kualitatif, R&D* . Alfabeta.

Sukarelawa, M. I., Indratno, T. K., & Ayu, S. M. (2024). *N-Gain vs Stacking Analisis Perubahan Abilitas Peserta Didik dalam Desain One Group Pretest Postest*. Surya Cahaya.

Syamsuri, M. M. F., Rahmadhani, I. T., & Rosilawati, I. (2023). Using Discovery Learning to Improve Students' Chemical Problem-Solving Skills. *IJCER (International Journal of Chemistry Education Research)*, *7*(1), 6–10. https://doi.org/10.20885/ijcer.vol7.iss1.art2

Weinhandl, R., Baldinger, S., & Riegler, V. (2025). Design Characteristics for Discovery Learning within Digital Mathematics Learning Environments from Students' Perspectives. *International Journal of Science and Mathematics Education*, *23*(8), 3981–4009. https://doi.org/10.1007/s10763-025-10619-x