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CORRELATION OF ACTIVE PARTICIPATION WITH MATHEMATICS LEARNING OUTCOMES OF GRADE 2 STUDENTS ON PLACE VALUE MATERIAL

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Abstract
The background of this study is based on the low achievement of students in understanding place value concepts, which is presumed to be related to the lack of active engagement during learning. This study aims to analyze the relationship between students' active participation and mathematics learning outcomes on place value material in Grade 2 of SDN 1 Pangenrejo. The research employed a quantitative approach using a correlational survey method. All Grade 2 students (N = 31) were included as the sample through total sampling. Data on active participation were collected using a standardized observation sheet, while learning outcomes were measured using a validated written test. Data analysis was conducted using the Spearman Rank correlation test because the data were not normally distributed. The results indicated that the relationship between students' active participation and mathematics learning outcomes was very low and not statistically significant. These findings suggest that student activeness in learning, particularly behavioral participation, does not necessarily reflect deep conceptual understanding; therefore, active participation alone is insufficient to improve mathematics learning outcomes. Other factors such as motivation, instructional strategies, and the role of teachers also contribute to learning outcomes. This study recommends the diversification of instructional strategies and the strengthening of teachers' roles in creating meaningful learning experiences. Further research with broader scope and variables is strongly recommended to enrich the understanding of factors influencing mathematics learning success in elementary schools.
Keywords: *Student Active Participation; Mathematics Learning Outcomes; Place Value*

Abstract
Latar belakang penelitian ini didasari oleh rendahnya capaian siswa dalam memahami konsep nilai tempat, yang diduga berkaitan dengan kurangnya keterlibatan aktif selama pembelajaran. Penelitian ini bertujuan untuk menganalisis hubungan antara partisipasi aktif siswa dengan hasil belajar Matematika pada materi nilai tempat di kelas 2 SDN 1 Pangenrejo. Penelitian menggunakan pendekatan kuantitatif dengan metode survei korelasional. Seluruh siswa kelas 2 (N=31) dijadikan sampel dengan teknik total sampling. Data partisipasi aktif diperoleh melalui lembar observasi terstandar, sedangkan hasil belajar diukur menggunakan tes tertulis yang telah divalidasi. Analisis data dilakukan dengan uji korelasi Spearman Rank karena data tidak berdistribusi normal. Hasil penelitian menunjukkan bahwa hubungan antara partisipasi aktif siswa dan hasil belajar Matematika berada pada tingkat yang sangat rendah dan tidak signifikan. Temuan ini mengindikasikan bahwa keaktifan siswa dalam pembelajaran, khususnya yang bersifat perilaku, belum tentu mencerminkan pemahaman konseptual yang mendalam, sehingga partisipasi aktif saja tidak cukup untuk meningkatkan hasil belajar Matematika. Faktor lain seperti motivasi, strategi pembelajaran, dan peran guru juga berkontribusi terhadap hasil belajar. Penelitian ini merekomendasikan perlunya diversifikasi strategi pembelajaran dan penguatan peran guru dalam menciptakan pembelajaran bermakna. Penelitian lanjutan dengan cakupan dan variabel yang lebih luas sangat dianjurkan untuk memperkaya pemahaman tentang faktor-faktor penentu keberhasilan belajar Matematika di sekolah dasar.
Kata Kunci: Partisipasi Aktif Siswa; Hasil Belajar Matematika; Nilai Tempat

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Introduction

Basic education plays a strategic role in building a superior and adaptive human resource foundation amid global dynamics (Fajartriani et al., 2024). Mathematics, as one of the core subjects in elementary school, not only develops numeracy skills, but also forms logical, critical, and creative mindsets in students (Lubis, 2021; Salsabila & Witri, 2023). However, the results of national and international surveys on junior high school students consistently still show the low achievement of Mathematics of Indonesian students, which can be a reflection of the lack of optimal Mathematics learning process in elementary schools (Prastitasari et al., 2022).

One of the fundamental problems that are still encountered at the elementary school level is the low understanding of students on the concept of place value. This difficulty not only occurs in students with learning barriers, but is also found in general at various levels of the early grades, which are not only limited to the cognitive aspect, but are also influenced by the attitude, motivation, and active involvement of students in learning (Afifah et al., 2022; Ananda & Damri, 2021; Harianti et al., 2022; Savitri et al., 2019).

According to the perspective of constructivism, learning will be meaningful if students are actively involved in building their knowledge through learning experiences. In Mathematics learning, teachers play the role of facilitators who encourage students to understand concepts through activities (Arafah et al., 2023).

Recent research shows that many elementary school students still make misconceptions, misspell number symbols, and fail to understand the position of numbers in numbers, even for simple numbers (Afifah et al., 2022; Harianti et al., 2022). This is reinforced by the findings Ananda & Damri (2021), which states that students' difficulty in understanding place values causes them to be unable to answer the practice questions correctly and only guess, thus failing to understand more complex number operations. In fact, the understanding of place values is the main foundation in basic calculation operations and mastery of advanced Mathematics material.

Student active participation is often associated with Mathematics learning outcomes because it reflects student involvement in the learning process (Alrajeh & Shindel, 2020; Maamin et al., 2021). Learning outcomes reflect the learning process that leads to the improvement and transformation of individual behavior (Nurhayati et al., 2025). Recent studies have consistently found that affective involvement (interest, positive attitudes, and motivation) is the main predictor of success in learning Mathematics. However, the practice of learning Mathematics in elementary school still tends to be centered, so students' opportunities to build conceptual understanding independently are not optimal (Prastitasari et al., 2022; Subia et al., 2018).

This is where it is located *Research gap* which is very crucial, the majority of previous research is more examine the relationship between students' motivations, attitudes, or activities with general Mathematics learning outcomes. However, studies that specifically examine the relationship between students' active participation and learning outcomes in place value materials, especially in elementary school grades, are still relatively limited (Afifah et al., 2022; Harianti et al., 2022). In fact, the value of rempat is a fundamental material that is a prerequisite for mastering advanced Mathematics concepts. Meanwhile, research Prastitasari et al., (2022) and Subia et al., (2018), emphasizing the importance of learning that encourages students' activities, motivation, and positive attitudes, But a study that specifically focused its impact on the material of place values in the lower classes It is still very rarely studied systematically.

The novelty of this research lies in the focus of a study that examines the relationship between active participation and Mathematics learning outcomes in the material of place values in elementary school grades. This study also considers the role of innovative learning strategies and teacher support in creating a learning environment that encourages student participation. Thus, this research not only contributes theoretically in filling the literature gap, but also offers practical implications for the improvement of the Mathematics learning model in primary schools. In particular, this study aims to determine the relationship between students' active participation and Mathematics learning outcomes in the 2nd grade of SDN 1 Pangenrejo. The results of this study are expected to provide an objective and comprehensive overview of the contribution of each dimension *of engagement* and motivation to students' Mathematics learning outcomes, as well as produce strategic recommendations for optimizing Mathematics learning based on students' active participation from an early age.

Based on this description, the formulation of this research problem is: What is the relationship between active participation and Mathematics learning outcomes in the 2nd grade of SDN 1 Pangenrejo? The results of this research are expected to make an empirical contribution to the development of Mathematics learning, especially in basic materials in elementary school lower grades.

Research Methods

This study uses a quantitative approach with a correlational survey method to identify the relationship between student active participation with Mathematics learning outcomes on the material on the value of the place in grade 2 of SDN 1 Pangenrejo. The survey method was chosen because it allows for systematic data collection using questionnaires and test instruments designed to be representative of the entire population (Scott, 2019). The correlational method is used to determine the level of relationship between the two main variables, namely active participation as an independent variable and learning outcomes as a dependent variable, without any intervention or manipulation of the research subject (Ramadhani & Albina, 2025).

This study was carried out at SDN 1 Pangenrejo, Purworejo District, Purworejo Regency, Central Java, in the odd semester of the 2025/2026 school year, precisely in September 2025. The research population includes all 2nd grade students of SDN 1 Pangenrejo which totals 31 people. Due to the relatively small population, *the total sampling* technique is applied so that the entire population is used as a research sample to obtain a comprehensive and representative picture. This research is based on Law Number 20 of 2003 concerning the National Education System which emphasizes that educational activities, including educational research, must support the learning process and development of students.

Data collection was carried out with two main instruments, namely active participation observation sheets and learning outcome tests Math. The active participation observation sheet used adapts the instrument from Anggraini et al., (2025), consists of four indicators, namely: (1) involvement in learning tasks, (2) participation in problem solving, (3) courage to ask questions or express opinions, and (4) courage to appear in front of the class, which is described in 15 measurable statements and the measurement scale used in this study refers to the scale Likert (1932), the assessment was carried out using five categories, namely 5 for Excellent, 4 for Good, 3 for Enough, 2 for Less, and 1 for Very Less. Learning outcome tests Math consists of 15 questions, consisting of 10 multiple-choice questions and 5 description questions, which are arranged to measure mastery of the concept of the value of the number of numbers up to 50 according to the learning outcomes in Phase A (Ministry of Education and Education, 2022).

The stages of the research are carried out systematically as shown in Figure 1 below:

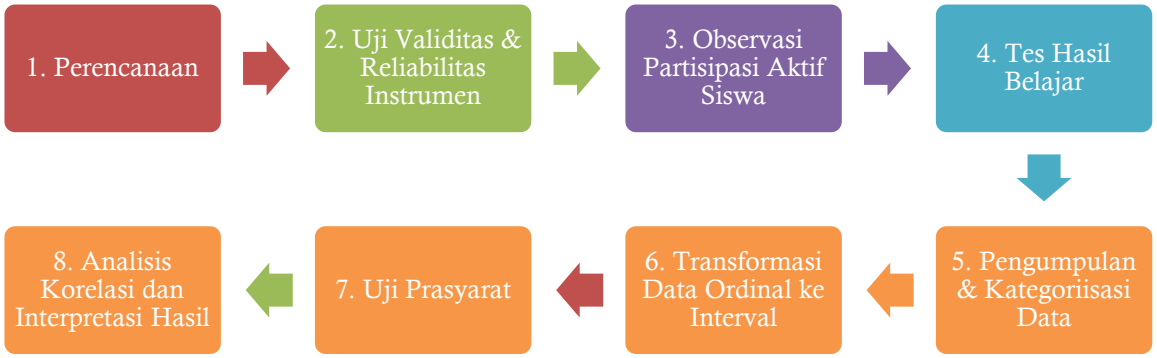

Figure 1. Research Stages

The research stage begins with planning which includes applying for permits to schools and developing observation instruments and learning outcome tests. Furthermore, the instrument was tested for validity and reliability in groups of students outside the main research sample to ensure the feasibility and consistency of the measuring tool. After the instrument is declared feasible, direct observation of students' active participation during the Mathematics learning process of place value material. The next stage is the administration of individual learning outcome tests in a controlled atmosphere to objectively measure student achievement. The observation and test results data are then collected and input into the SPSS software version 27 for further analysis.

Before the correlational analysis is carried out, the data on active participation and student learning outcomes are first categorized based on the criteria of the Arikunto (2021), namely: $X \geq (\bar{X} + SD)$ for Height; for Medium, and; for Low. $X - SD < X < (\bar{X} + SD) X \leq (\bar{X} - SD)$This categorization aims to map the distribution of active participation levels and learning outcomes Math students in a more informative way. Data transformation using *Method of Successive Interval* (MSI) is used as a supporting measure to improve the accuracy of ordinal data measurements, although the relationship analysis in this study still uses Spearman Rank correlation which does not require interval-scale data (Cahyaningtyas et al., 2025). The process of transforming ordinal data into interval data in this study uses Microsoft Excel STAT 97 (Vina, 2023).

The analysis prerequisite test was carried out with the normality test. If the data is not normally distributed, then correlation analysis is performed using a non-parametric test *Spearman Rank* (Kurniawan, 2023). The Spearman test is used to determine the strength and direction of the relationship between active participation with Mathematics learning outcomes. Hypothesis testing was performed at a significance level of 5% (α= 0.05), with the criterion: if the significance value < 0.05 then H0 rejected and H1 accepted, meaning that there is a significant relationship between the two variables. Conversely, if the significance value > 0.05, H0 is accepted and H1 is rejected, meaning that there is no significant relationship between the two variables (Fandini et al., 2019). The correlation strength between variables is interpreted using the correlation test category Sugiyono (2018) : 0.00–0.199 (very low); 0.20–0.399 (low); 0.40–0.599 (moderate); 0.60–0.799 (strong), and; 0.80–1,000 (very strong).

The entire series of research is carried out by paying attention to the ethical principles of educational research. With systematic research stages and analysis with valid and confidential data, the results of the research are expected to make a meaningful empirical contribution in

understanding the correlation between active participation and students' Mathematics learning outcomes in the place value material in the lower grade of elementary school.

Results and Discussion

Results

Stages of Research Planning

The research stage begins with a planning process that includes applying for a research permit to the Principal of SDN 1 Pangenrejo and coordination with the 2nd grade homeroom teacher. At this stage, the development and preparation of research instruments was also carried out, namely student active participation observation sheets and Mathematics learning outcome test tools on place value materials. The preparation of the instrument refers to indicators that have been validated in the literature and in consultation with Mathematics education experts.

Instrument Validity and Reliability Test Results

After the instrument was developed, a content validity test was carried out by asking for input from two expert lecturers and one senior Mathematics teacher. The results of the experts' research stated that the instrument is valid and can be used to retrieve research data. Furthermore, the reliability test was carried out with a trial on 15 students outside the main sample. The results of the reliability test using *Cronbach's Alpha* shown in Table 1 below:

Table 1. Instrument Test Results Using *Cronbach's Alpha*

Instruments	Cronbach's Alpha	Number of Items	Categories
Active Participation (Observation)	0,860	15	Reliable
Learning Outcome Test (Multiple Choice)	0,794	10	Reliable
Learning Outcome Test (Short Filling)	0,803	5	Reliable

As seen in Table 1, all instruments meet the reliability criteria ($\alpha > 0.6$) (Najib et al., 2024; Sugiyono, 2018) so that it is suitable for use in research.

Results of Active Participation Observation and Student Learning Outcome Tests

Observation is carried out during the learning process of Mathematics of place value material in grade 2. The researcher as an observer recorded the active participation score of each student based on 15 indicators that had been determined. The results of observations show that the level of active participation of students varies quite widely. After observation of student active participation, all students (N = 31) took a learning outcome test consisting of 10 multiple-choice questions and 5 short-fill questions. The data on active participation observation scores and learning outcome test scores are collected and recorded manually, then input into statistical software for further analysis. This process ensures data accuracy and minimizes recording errors. The score of the Observation result and the test result are presented in Table 2.

Table 2. Observation Results Score and Learning Outcome Test

Yes	Subject Initials	Observation Score (Ordinal Data)	Test Scores (Data Interval)
1	AW	36	85
2	AANS	63	85
3	ON	42	85
4	ANP	34	100
5	AP	35	35
6	ASE	39	100
7	AAS	36	85
8	ASA	47	90
9	AAFL	53	75
10	ACR	68	95
11	AN	44	90
12	ARD	56	100
13	BCP	15	15
14	BF	61	60
15	FNW	39	15
16	FAM	39	100
17	GWM	42	65
18	HAH	45	100
19	IMM	40	90
20	KTS	47	90
21	KPC	33	65
22	MIN	43	50
23	MRA	38	20
24	NAHW	35	65
25	NHZ	55	55
26	RNP	43	60
27	SANF	37	90
28	SKF	38	55
29	SDA	34	85
30	YSO	40	15
31	ZAR	51	75

Table 2 shows that the observation score (active participation) has the highest score of 68 obtained by ACR students. Meanwhile, the lowest score of 15 was obtained by BCP students. Meanwhile, in the learning outcome test score, the highest score was 100 obtained by several students such as ANP, ASE, ARD, FAM, and HAH. While the lowest score was 15 obtained by BCP, FNW, and YSO students. In general, Table 2 illustrates the difference in the level of participation and student learning outcomes in the place value material.

Categorization of Active Participation Data and Learning Outcomes

Prior to statistical analysis, active participation data and learning outcomes were categorized according to criteria from Arikunto (2021). The results of the categorization of students' active participation scores are presented in Table 3.

Table 3. Results of Student Active Participation Categorization

Criteria Limits	Active Participation Categories	Number of Students	Percentage (%)
$X \geq 53{,}14$	Height	6	19,35
$32{,}54 < X < 53{,}14$	Medium	24	77,42
$X \leq 32{,}54$	Low	1	3,23

It can be seen from Table 3 that the active participation category of students is dominated by the medium category, which is 24 students (77.42%). Furthermore, there were 6 students (19.35%) who were included in the high category, and 1 student (3.23%) who was in the low category. This data shows that most students have had a fairly good level of active participation in learning activities, although they have not yet fully reached the high category. This indicates that students' active participation has begun to be active in asking, answering, and participating in group activities, but teachers' efforts are still needed to increase motivation and learning strategies so that students' active participation can develop in the classroom.

Furthermore, the categorization of student learning outcomes is carried out, as presented in Table 4.

Table 4. Results of Categorization of Learning Outcomes

Criteria Limits	Learning Outcomes Categories	Number of Students	Percentage (%)
$X \geq 97{,}57$	Height	5	16,13
$44{,}04 < X < 97{,}57$	Medium	21	67,74
$X \leq 44{,}04$	Low	5	16,13

Based on Table 4, it is known that the category of student learning outcomes is mostly in the medium category, namely 21 students (67.74%). Furthermore, there were 5 students (16.13%) who were included in the high category, and 5 other students (16.13%) who were in the low category. These results show that students' Mathematics learning outcomes in place value materials tend to be at a fairly good level, although there are still differences in abilities between individuals. Some students have been able to understand the concept of place value well, while others still need additional assistance. These findings affirm the importance of the role of teachers in providing more intensive guidance and implementing varied learning strategies so that all students can achieve optimal learning outcomes.

Results of Ordinal to Interval Data Transformation (MSI)

Before data analysis using SPSS, active participation (ordinal) data was transformed into interval data using *Method of Successive Interval (MSI)* through Microsoft Excel software, so that the data meets the prerequisites for advanced statistical analysis. The process of transforming ordinal data into interval data in this study uses Microsoft Excel STAT 97 (Vina, 2023). The data on the transformation results are presented in Table 5.

Table 5. Observation Result Score (After Transformation) and Test Result

Yes	Subject Initials	Observation Score	Test Scores
1	AW	36,142	85
2	AANS	57,635	85
3	ON	41,863	85
4	ANP	35,869	100
5	AP	34,736	35
6	ASE	39,039	100

7	AAS	37,259	85
8	ASA	46,514	90
9	AAFL	50,709	75
10	ACR	61,059	95
11	AN	42,884	90
12	ARD	52,742	100
13	BCP	15,000	15
14	BF	56,185	60
15	FNW	39,547	15
16	FAM	39,039	100
17	GWM	41,616	65
18	HAH	44,158	100
19	IMM	40,107	90
20	KTS	46,272	90
21	KPC	35,035	65
22	MIN	43,285	50
23	MRA	38,793	20
24	NAHW	36,580	65
25	NHZ	51,605	55
26	RNP	43,486	60
27	SANF	38,192	90
28	SKF	39,243	55
29	SDA	35,830	85
30	YSO	41,382	15
31	ZAR	48,937	75

The data in Table 5 can be presented descriptively as in Table 6, to make it easier to understand.

Table 6. Descriptive Active Participation Data and Learning Outcomes

Variable	N	Minimum	Maximum	Red	Std. Deviation
Active Participation	31	15	68	42,84	10,469
Learning Outcomes	31	15	100	70,81	27,206
Valid N (listwise)	31				

Based on Table 6, the active participation of students has a minimum score of 15, a maximum of 68, with a mean of 42.84 and a standard deviation of 10.469. The average score shows that the active participation rate of students is in the moderate category (77.42), with relatively little variation between individuals. Meanwhile, students' Mathematics learning outcomes have a minimum score of 15, a maximum of 100, with an average of 70.81 and a standard deviation of 27.206.

Based on the results of the categorization, most students are in the medium category (67.74%), while only a small percentage are in the high and low categories. Thus, student learning outcomes are generally in the medium category, which shows that students' understanding of the place value material is quite good, but still needs improvement in order to reach the high category evenly.

Results of the Prerequisite Test Analysis

The next step is to conduct a prerequisite test for analysis. This test includes a normality test to ensure whether the data meets the statistical assumptions for correlation analysis. The results of the normality test will determine the type of correlation test used, whether parametric or nonparametric, so that the interpretation of the relationship between active participation and learning outcomes can be carried out accurately and according to scientific procedures.

Table 7. Normality Test

Variable	Shapiro-Wilk		
	Statistic	df	Sig.
Active Participation	,917	31	,019
Learning Outcomes	,864	31	<,001

From Table 7, the normality test in this study uses the Shapiro-Wilk test, because the sample size is less than 50 respondents (Parlaungan et al., 2023). It can be seen that the results of the Shapiro-Wilk test obtained a significance value for active participation of 0.019 and learning outcomes of <0.001. If the significance value is smaller (<) than 0.05, the data is declared not to be normally distributed. Because the parametric test requirements were not met, the analysis of the relationship between variables was carried out using the Spearman Rank nonparametric test. This test was chosen because it is able to measure the strength and direction of the relationship between two ordinal variables or data that are not normally distributed (Suherman et al., 2025). Therefore, the analysis of the relationship between variables was carried out using the nonparametric Spearman Rank test.

Results of Correlation Analysis and Interpretation of Results

The results of the Spearman Rank correlation test are presented in Table 8.

Table 8. Spearman Rank Correlation Test

			Active Participation	Learning Outcomes
Spearman's rho	Active Participation	Correlation Coefficient	1,000	,187
		Sig. (2-tailed)	.	,314
		N	31	31
	Learning Outcomes	Correlation Coefficient	,187	1,000
		Sig. (2-tailed)	,314	.
		N	31	31

Table 8 shows a correlation coefficient of 0.187 with a significance value of 0.314. The value of the spearman correlation coefficient of (rs = +0.187) is positive. When viewed from Table 8, the correlation coefficient of 0.187 is included in the interval of 0.00-0.199 with the category of Very Low Tightness.

The data shows that the relationship between active participation and learning outcomes is positive or unidirectional, meaning that the higher the active participation of students, the learning outcomes also tend to increase. However, the correlation coefficient value of 0.187 belongs to the Very Low category, and the spearman significance value of (p-value = 0.314>0.05) suggests that the relationship is not statistically significant. Thus, the zero

hypothesis (H_0) was accepted and there was no significant relationship between students' active participation and Mathematics learning outcomes in the place value material in grade 2 of SDN 1 Pangenrejo, although the direction of the relationship was positive.

Summary of Key Findings

This study aims to determine the relationship between students' active participation and Mathematics learning outcomes in the place value material in grade 2 of SDN 1 Pangenrejo. The results of the analysis showed that there was no significant relationship between active participation and mathematics learning outcomes, with a Spearman Rank correlation coefficient of 0.187 and a significance of 0.314 ($p > 0.05$). This very low correlation value shows that the variation in the level of student activity during learning is not directly related to the achievement of Mathematics learning outcomes in the place value material.

Discussion

Empirically, these findings confirm that increased activeness is not necessarily in line with an increase in learning outcomes. Student active participation is part of externally observed behavioral engagement through actions such as participating in class discussions or answering questions, while cognitive involvement reflects students' mental efforts in understanding and mastering learning material in depth (Yusriah et al., 2024). In other words, active participation has not been identified as the main determinant of Mathematics learning outcomes in the place value material for grade 2 elementary school students. This also indicates that there are other factors that also affect student learning outcomes, such as motivation, teacher competence, teacher-student communication, learning discipline, classroom management, school organizational climate, and self-management (Yandi et al., 2023). Previous research has also shown that the influence of active participation on Mathematics learning outcomes can vary according to the learning environment and student characteristics Lathif et al., (2023), and that student activity contributes to problem-solving skills but is not the only determinant of learning success (Subagyo et al., 2025).

The results of this study reinforce the view that activeness during learning does not always reflect conceptual understanding. Active students may not understand the material well, while students who look passive may have a strong understanding. Therefore, increasing student active participation needs to be accompanied by a learning strategy that is able to accommodate diverse learning needs (Rohmani et al., 2023).

Teachers play an important role in creating an interesting learning atmosphere so that students are encouraged to ask questions, answer, and express their opinions. The effectiveness and creativity of teachers have a great influence on learning success, which is ultimately influenced by the level of student involvement (Ripki et al., 2023). In order for active participation to have an impact on learning outcomes, teachers need to manage classes effectively and apply varied and innovative learning methods (Rohmani et al., 2023). The implications of these weak or insignificant relationship findings suggest that learning is not enough to emphasize student activeness, but needs to be directed toward activities that encourage conceptual understanding, such as reflective discussion, the use of concrete–abstract examples, and contextual problem-solving.

The study was limited to one school with a small sample size (31 students), so the results could not be generalized to the wider population. Active participation observation instruments have the potential to contain subjectivity biases even though they have been validated. The

research focuses only on the material of place value, and has not directly identified other factors that may affect student learning outcomes, such as intrinsic motivation or family support.

Subsequent research is suggested using a larger and more diverse sample, as well as expanding the scope of Mathematics material. It is also important to explore other factors such as motivation, learning styles, teachers' strategies, and the role of family and peers. The use of *mixed-methods* will enrich quantitative findings with qualitative data, thereby providing a deeper understanding of the Mathematics learning process in elementary schools.

Conclusion

Based on the results of the study on the relationship between active participation and Mathematics learning outcomes in the 2nd grade of SDN 1 Pangenrejo, it can be concluded that students' active participation shows a very low and insignificant positive correlation to Mathematics learning outcomes (Spearman Rank correlation coefficient of 0.187 with a significance of 0.314, $p > 0.05$). These findings indicate that the level of student activity during the learning process has not directly affected the achievement of learning outcomes in the place value material. Thus, active participation is not the only determining factor for the success of learning Mathematics; There are other factors such as motivation, teacher competence, learning strategies, classroom management, and environmental support that also play an important role. The practical implication of these results is the need to diversify learning strategies that not only emphasize activeness, but also strengthen students' in-depth understanding of Mathematics concepts. The study was limited by a small sample count, limited material coverage, and had not thoroughly identified other external factors. Therefore, it is recommended that further research use a broader sample, covering diverse materials, and explore other variables such as learning motivation, innovative learning strategies, and the role of the family, so as to provide a more comprehensive picture of the factors that affect Mathematics learning outcomes in elementary schools.

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