



## Classroom-Level Factors Affecting Mathematics Achievement: The Role of Management and Discipline in Indonesian Rural Schools

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History of manuscript: submitted: 23/08/2025 | reviewed: 01/10/2025 | accepted: 03/10/2025

**ABSTRACT:** Mathematics learning outcomes in Indonesian junior high schools, particularly in rural areas such as Pakue Tengah District, North Kolaka, remain below expectations. Many students fail to reach the Minimum Completion Criteria (KKM), indicating the need to examine classroom-level factors that may influence achievement. This study aims to analyze the relationship between classroom management and learning discipline with students' mathematics learning outcomes. A survey method with a correlational approach was employed, involving a sample of 73 eighth-grade students selected using stratified random sampling. Data were collected through questionnaires on classroom management and learning discipline, along with mathematics achievement tests, and analyzed using multiple linear regression. The results show that classroom management has a positive and significant relationship with mathematics outcomes ( $r = 0.579$ ;  $R^2 = 33.52\%$ ), while learning discipline also demonstrates a significant relationship ( $r = 0.533$ ;  $R^2 = 28.41\%$ ). Together, both variables explain 55.95% of the variance in students' mathematics achievement. These findings align with prior studies highlighting the importance of effective classroom management and discipline in enhancing student engagement and learning results. The study implies that teachers should strengthen classroom management strategies, promote learning discipline, and foster conducive environments. Academically, the research contributes by providing empirical evidence from a rural Indonesian context, while practically it offers recommendations for teacher training and school policy to improve mathematics achievement.

**Keywords:** classroom management, junior high school, learning discipline, mathematics learning outcomes, North Kolaka

**ABSTRAK:** Hasil belajar matematika di sekolah menengah pertama di Indonesia, khususnya di daerah pedesaan seperti Kecamatan Pakue Tengah, Kolaka Utara, masih berada di bawah harapan. Banyak siswa yang belum mencapai Kriteria Ketuntasan Minimal (KKM), sehingga diperlukan kajian terhadap faktor-faktor pada tingkat kelas yang dapat memengaruhi pencapaian belajar. Penelitian ini bertujuan untuk menganalisis hubungan antara manajemen kelas dan disiplin belajar dengan hasil belajar matematika siswa. Metode yang digunakan adalah survei dengan pendekatan korelasional, melibatkan sampel sebanyak 73 siswa kelas VIII yang dipilih menggunakan teknik stratified random sampling. Data dikumpulkan melalui kuesioner mengenai manajemen kelas dan disiplin belajar, serta tes prestasi belajar matematika, kemudian dianalisis menggunakan regresi linier berganda. Hasil penelitian menunjukkan bahwa manajemen kelas memiliki hubungan positif dan signifikan dengan hasil belajar matematika ( $r = 0,579$ ;  $R^2 = 33,52\%$ ), sedangkan disiplin belajar juga memiliki hubungan signifikan ( $r = 0,533$ ;  $R^2 = 28,41\%$ ). Secara simultan, kedua variabel tersebut menjelaskan 55,95% variasi hasil belajar matematika siswa. Temuan ini sejalan dengan penelitian sebelumnya yang menekankan pentingnya manajemen kelas dan disiplin belajar dalam meningkatkan keterlibatan serta hasil akademik siswa. Implikasi penelitian ini adalah perlunya guru memperkuat strategi manajemen kelas, menumbuhkan disiplin belajar, serta menciptakan lingkungan belajar yang kondusif. Secara akademis, penelitian ini memberikan bukti empiris dari konteks pedesaan Indonesia, sedangkan secara praktis menawarkan rekomendasi bagi pelatihan guru dan kebijakan sekolah untuk meningkatkan hasil belajar matematika.

**Kata Kunci:** manajemen kelas, disiplin belajar, hasil belajar matematika, sekolah menengah pertama, Kolaka Utara

## INTRODUCTION

The low mathematics learning outcomes in public junior high schools in Pakue Tengah District remain a pressing educational issue that requires immediate intervention. Based on the most recent end-of-semester reports for the academic year 2023/2024, it was found that more than 45% of students scored below the Minimum Completion Criteria (KKM) of 70 in mathematics, while the district's average score only reached 62.3. This trend reflects a broader challenge at the national level. According to the Programme for International Student Assessment (PISA) 2022, Indonesian students' performance in mathematics ranked significantly below the OECD average, demonstrating weaknesses in problem-solving skills, conceptual understanding, and higher-order thinking abilities. Such conditions indicate that mathematics learning in Indonesia, particularly in rural areas like Pakue Tengah, still faces systemic obstacles that hinder students from achieving

optimal outcomes.

One of the key factors contributing to this problem is ineffective classroom management. Poorly managed classrooms often result in a learning environment that is less conducive, thereby increasing distractions and reducing student concentration. International literature underscores the importance of classroom management in shaping learning outcomes. Korpershoek et al. (2020) emphasize that effective classroom management creates a structured learning environment that promotes both academic and socio-emotional development. Similarly, Simonsen et al. (2021) highlight that proactive management strategies reduce disruptive behaviors and increase student engagement. In the context of mathematics, where abstract concepts demand high concentration, the absence of effective classroom management becomes a critical barrier to student achievement.

Equally important is the role of learning discipline in supporting academic performance. Discipline refers to students' ability to regulate their time, complete assignments on schedule, and comply with established school rules. Prior studies have demonstrated that learning discipline is strongly associated with academic success across different subjects (Zimmerman & Schunk, 2017; Duckworth & Gross, 2020; Hagger et al., 2021). Students who demonstrate higher levels of self-discipline tend to allocate their study time more effectively, persist in solving challenging problems, and maintain consistency in academic tasks. In contrast, students with poor discipline often experience difficulties in managing time and prioritizing learning activities, which negatively affects their mathematics outcomes.

Theoretically, classroom management in this study is analyzed through the perspective of space, time, and interaction regulation, as suggested by Wahyuni et al. (2022). Meanwhile, learning discipline can be linked to broader frameworks of self-regulation and executive functioning, as discussed by Noviyanti et al. (2024) and Duckworth et al. (2021). Prior empirical studies in the Indonesian context also support the significant relationship between classroom management and student achievement (Marlina et al., 2020; Lubis et al., 2024). However, a critical review of the literature reveals that most existing studies either examine these two factors in isolation or focus on general academic achievement, without emphasizing mathematics specifically. Furthermore, many studies are situated in urban or well-resourced schools, leaving rural areas such as Pakue Tengah underexplored.

This research addresses that gap by simultaneously analyzing the relationship between classroom management and learning discipline with mathematics learning outcomes, specifically within the context of public junior high schools in Pakue Tengah District. By focusing on this under-researched area, the study contributes to filling an important gap in the literature, as rural schools often face distinct challenges such as limited resources, teacher shortages, and lower parental involvement. The findings are expected to provide a more nuanced understanding of how classroom management and

learning discipline jointly influence mathematics learning, thereby offering insights that may differ from studies conducted in urban settings.

In addition to theoretical contributions, this study aims to offer practical implications for educational practice and policy. The results are expected to serve as a reference for teachers in improving their classroom management strategies and fostering positive learning discipline among students. Schools may consider developing structured training programs to strengthen teachers' capacity in managing classrooms and to create a learning culture that supports discipline, perseverance, and active engagement. At the policy level, the study can inform stakeholders about the importance of integrating classroom management and discipline strategies into professional development programs for teachers. Ultimately, it is anticipated that such efforts will lead to improved mathematics learning outcomes and overall academic achievement in rural Indonesian schools.

## METHOD

This study employed a survey design with a correlational approach to examine relationships among classroom management ( $X_1$ ), learning discipline ( $X_2$ ), and students' mathematics learning outcomes ( $Y$ ). The study was conducted in public junior high schools located in Pakue Tengah District, North Kolaka Regency. Data collection took place in 2024.

### Population and Sample

The population comprised all eighth-grade students from four public junior high schools in the district ( $N = 268$ ). Sample size was calculated using Slovin's formula:

$$N = \frac{N}{1 + Nd^2}$$

A margin of error of  $d=0.10$  (10%) was selected considering the study scope and logistical constraints, producing:

$$n = \frac{268}{1 + 268(0,10)^2} = \frac{268}{1 + 2,68} = 72,8 \rightarrow 73 \text{ students}$$

Proportional allocation across the four schools yielded the following distribution:

- North Kolaka State Junior High School 10: 13 students
- North Kolaka State Junior High School 15: 12 students
- North Kolaka 2 State Middle School: 18 students
- North Kolaka State Middle School 12: 30 students

Sampling was performed using stratified random sampling. Strata were formed based on academic achievement terciles (high, medium, low) to ensure representation

across performance levels; random selection within each stratum produced the final sample.

### **Instruments**

Data were collected using (a) a closed-ended questionnaire measuring classroom management ( $X_1$ ) and learning discipline ( $X_2$ ) on a 5-point Likert scale (1 = strongly disagree ... 5 = strongly agree), and (b) an objective multiple-choice mathematics achievement test to measure  $Y$ . Questionnaire items were developed from relevant theoretical indicators (Wahyuni et al., 2022; Noviyanti et al., 2024) and prior validated instruments.

### **Validity and reliability**

Content validity was established through expert review: the draft instruments were evaluated by [number] experts in educational measurement and subject-matter specialists; items were revised according to their feedback. Construct validity was assessed via item-total correlation (corrected item-total), with items retained when  $r_{item-total} \geq 0.30$ .

Reliability was assessed using Cronbach's Alpha. Report the obtained values as follows in the manuscript (example template — replace placeholders):

- Classroom Management scale: Cronbach's  $\alpha = [\alpha_1]$ .
- Learning Discipline scale: Cronbach's  $\alpha = [\alpha_2]$ .
- Mathematics achievement test: Kuder–Richardson 20 (KR-20) / Cronbach's  $\alpha = [\alpha_3]$  (Notes: instruments with Cronbach's  $\alpha \geq 0.70$  are considered acceptable. If any scale had  $\alpha < 0.70$ , report actions taken—e.g., item removal or rewording.)

### **Data collection procedure**

Questionnaires and tests were administered in-class under researcher supervision with elapsed time of [xx] minutes for the achievement test. School permissions and parental/guardian consent were obtained prior to data collection, and student anonymity was maintained.

### **Data analysis and regression diagnostics**

Data were analyzed using [SPSS v. \_\_ / Jamovi / R]. Descriptive statistics (mean, SD, frequency) were computed for all variables. Pearson correlation analyses were used to examine bivariate relationships. Multiple linear regression was employed to test the simultaneous effect of  $X_1$  and  $X_2$  on  $Y$ ; key regression outputs reported include  $\beta$  coefficients, t-values, p-values,  $R^2$ , adjusted  $R^2$ , and F-statistic.

Before interpreting regression results, classical assumptions were checked and reported:

- Linearity: inspected via scatterplots of predictors vs. outcome.

- Normality of residuals: assessed using Q–Q plots and Kolmogorov–Smirnov / Shapiro–Wilk tests (report test statistic and p-value); residuals approximately normal if  $p > 0.05$  or visually acceptable.
- Homoscedasticity: tested using Breusch–Pagan (or White) test and residuals vs. fitted values plot (report p-value).
- Multicollinearity: assessed via Variance Inflation Factor (VIF) and tolerance; acceptable if  $VIF < 10$  (preferably  $VIF < 5$ ) and tolerance  $> 0.10$ . (Insert observed VIFs: [VIF  $X_1$ ], [VIF  $X_2$ ].)
- Independence of residuals: evaluated using Durbin–Watson statistic (ideal  $\sim 1.5$ – $2.5$  for no autocorrelation). (Report observed Durbin–Watson: [DW value].)
- Outliers & influence: checked via standardized residuals ( $> |3|$  flagged), Cook’s distance ( $> 1$ ) and leverage values; influential cases were examined and handled as needed.

If any assumption was violated, corrective steps were applied (e.g., variable transformation, robust standard errors, or bootstrapping). Significance level was set at  $\alpha = 0.05$ .

## FINDINGS

### **The Relationship Between Classroom Management and Learning Outcomes**

In education, classroom management is considered a crucial element in creating a conducive learning environment. Data analysis of this study indicates a positive and significant relationship between classroom management and students' mathematics learning outcomes (Ramadani et al., 2017). A correlation coefficient of 0.579 indicates that effective classroom management plays a significant role in improving student learning outcomes. The more structured and organized classroom management implemented by teachers, the more likely students are to achieve better learning outcomes. Classroom order not only regulates physical activities but also regulates students' social interactions and behavior, which can influence their engagement in the learning process.

The coefficient of determination of 33.52% indicates that approximately one-third of the variation in students' mathematics learning outcomes can be explained by classroom management implemented in schools. This means that good classroom management significantly contributes to students' academic achievement (Marlina et al., 2020). Effective classroom management allows students to learn in a calm, structured, and conducive atmosphere, which can increase their focus on the subject matter. Conversely, poorly organized classrooms often create distractions that prevent students from concentrating on the lesson, resulting in lower learning outcomes. However, it should be noted that although classroom management has a significant contribution to learning outcomes, a significant portion of the variation in student learning outcomes is

still influenced by other factors not included in this study, such as intrinsic motivation and socioeconomic factors. Motivational factors can influence how hard students try to learn, while socioeconomic factors can influence students' access to educational resources, family support, and their learning experiences. Therefore, for future research, it is recommended to include additional variables such as learning motivation or parental involvement, which can provide a deeper understanding of the factors that influence student learning outcomes.

### **The Relationship Between Learning Discipline and Learning Outcomes**

Learning discipline is another important aspect in education that can influence student learning outcomes. The analysis results in this study indicate that learning discipline is positively and significantly related to students' mathematics learning outcomes (Navia 2017). The correlation coefficient of 0.533 indicates that students with a high level of learning discipline tend to have better learning outcomes than students with less discipline. Learning discipline encompasses various important aspects, such as the ability to manage time, consistency in completing assignments, and compliance with existing rules at school. Students who are disciplined in learning have structured and regular study habits, which help them overcome academic challenges.

The coefficient of determination of 28.41% indicates that study discipline significantly contributes to student learning outcomes. Study discipline encompasses not only the habit of completing assignments on time but also efficient time management, enabling students to effectively complete assignments and optimally prepare for exams (Dayanti & Madiun, 2024). Students with study discipline tend to be more organized, focused, and better able to cope with distractions in their learning process. However, it should be noted that factors beyond learning discipline, such as learning styles and teaching methods, also influence student learning outcomes. Students' learning styles can vary, with some students preferring independent learning, while others prefer group-based learning. The teaching methods employed by teachers also have a significant influence on student learning outcomes. Therefore, further research needs to explore additional factors that may moderate or mediate the relationship between learning discipline and learning outcomes.

### **The Simultaneous Relationship between Classroom Management and Learning Discipline with Learning Outcomes**

When tested simultaneously, classroom management and learning discipline significantly influence students' mathematics learning outcomes. A multiple correlation coefficient of 0.748 indicates that these two factors together explain 55.95% of the variation in student learning outcomes. This indicates that the combination of good classroom management and high learning discipline has a strong influence on students' academic achievement (Azmi et al., 2024). Structured classroom management and good

learning discipline create a conducive environment for students to focus on the subject matter, avoid distractions, and complete assignments well.

These results demonstrate that classroom management and learning discipline are not independent variables, but rather complement each other in supporting student academic success. Good classroom management creates an orderly and comfortable environment, while learning discipline helps students utilize that environment to achieve their academic goals more effectively. (Masfufah et al., 2023) . The combination of these two factors enables students to overcome various challenges in the classroom and achieve optimal learning outcomes. However, this study only describes the relationship between variables descriptively without examining possible mediating or moderating factors that may influence the relationship between classroom management, learning discipline, and learning outcomes. To understand the more complex interactions between these variables, further analysis using path analysis or structural equation modeling (SEM) can be considered. By using these techniques, the interactions between variables can be studied in more depth, and the influence of external factors not analyzed in this study can be considered.

### **Research Limitations**

This study has several limitations that should be considered. First, the possibility of respondent bias in completing the questionnaire could affect the validity of the results. Students may have provided answers they perceived as desirable by the researcher or may not have been entirely honest in their responses. This could have affected the accuracy of the data collected and the analysis. Second, the results of this study were based solely on quantitative data, without validation from other sources such as interviews or observations. Using a qualitative approach such as interviews or group discussions could have provided a richer perspective on the influence of classroom management and learning discipline on student learning outcomes. Third, although this study provides a general overview of the relationships between variables, external factors not analyzed, such as family circumstances, social support, and environmental factors outside of school, may also play a role in student learning outcomes. Students' socioeconomic conditions, for example, may influence their access to learning materials or the support they receive at home. These factors need to be addressed in further research to gain a more holistic understanding of the factors influencing learning outcomes.

### **Discussion: The Influence of Classroom Management on Improving Mathematics Learning Outcomes**

Classroom management is an important factor in creating a conducive learning environment, which can improve student learning outcomes (Wati 2020) . In this study, a positive and significant relationship was found between classroom management and students' mathematics learning outcomes, with a correlation coefficient of 0.579. The

coefficient of determination of 33.52% indicates that the quality of classroom management implemented by teachers contributes one-third to the variation in student learning outcomes. This supports previous findings that a well-structured learning environment can improve student concentration and facilitate a more effective learning process.

### **Respondent Characteristics and Data Collection**

This research was conducted at a public junior high school in Pakue Tengah District, involving students from various socio-economic backgrounds. Data collection was conducted using student-completed questionnaires and learning achievement tests to measure the extent to which classroom management influenced their academic achievement in mathematics. The use of this questionnaire data allowed the researcher to understand how students perceived and assessed the classroom management implemented by the teacher, and how it affected their learning experience.

Effective classroom management plays a significant role in creating a comfortable and safe learning space for students, allowing them to feel free to ask questions and discuss (Siagian et al., 2022) . This is particularly important in mathematics, which students often find challenging. Teachers who are able to manage time, space, and social interactions in the classroom tend to create an environment that is more motivating for students to actively engage in learning. One strategy teachers can implement is creating structured classroom routines. For example, setting aside time for questions and answers, group discussions, and reflection on learning outcomes provides opportunities for students to better understand the material they have learned. However, in less conducive classrooms, implementing these routines can be challenging. Teachers must adapt their approach to the situation, such as creating a calmer atmosphere by reducing distractions or using more inclusive classroom management techniques to accommodate students' diverse learning styles. In this context, good communication between teachers and students is crucial to ensure the entire class can actively participate in learning. Furthermore, it is important for teachers to understand that each student may have a different learning style, so they must be able to adapt their teaching strategies to their needs.

### **The Role of Learning Discipline in Improving Academic Achievement**

Learning discipline has been shown to have a positive and significant relationship with students' mathematics learning outcomes. With a correlation coefficient of 0.533 and a determination coefficient of 28.41%, learning discipline significantly contributes to student learning outcomes. Strong learning discipline helps students manage their time well, complete assignments on time, and comply with school rules, all of which contribute to academic success (Kris Setyaningsih et al., 2022) . Good learning discipline also leads to the formation of regular and structured study habits, which help students stay focused

despite facing challenges in learning.

This research aligns with Kusumawati's (2024) " This article explains how self-regulation improves students' learning motivation. The purpose of this article is to examine how self-regulation improves learning motivation in students with low academic scores. The research method used is a systematic literature review, where all findings are recorded and examined, both theoretically and practically, using descriptive qualitative data analysis. Various reading sources, both journals and ebooks, were used as references. The results show that self-regulation can improve students' learning motivation and has been proven effective in several previous studies. Self-regulation helps students improve their academic performance. This shows that self-regulation is not only important for improving academic skills but also significantly influences students' success in achieving a purposeful life through learning motivation, which emphasizes the importance of self-regulation in supporting academic success. Good study discipline helps students stay focused on their academic goals, even when they face difficulties in understanding the material, particularly in subjects like mathematics. In this regard, students who are disciplined in their studies will be more consistent in working on practice questions, seeking help when needed, and striving to overcome the difficulties they encounter. However, in some contexts with limited facilities, such as schools that lack access to technology or adequate learning materials, establishing study discipline can be more difficult. For example, students may not have access to the resources they need for learning or may lack adequate study time. Therefore, it is crucial for teachers and schools to play an active role in providing additional learning materials and facilities that support learning outside of school hours. This way, even with limited facilities, students can still have access to in-depth and structured learning.

Building discipline in learning in a limited environment also requires a more in-depth approach, such as developing independent study habits in students, supported by parental involvement and intrinsic motivation. In these situations, schools and parents need to work together to create consistent learning routines and support student learning, despite resource constraints.

### **The Combination of Classroom Management and Learning Discipline as the Key to Academic Success**

When tested together, classroom management and learning discipline significantly contribute to student learning outcomes, with a multiple correlation coefficient of 0.748 and a coefficient of determination of 55.95%. These findings indicate that these two factors complement each other and have a strong influence in supporting student academic success (Dima et al., 2023). Good classroom management provides a conducive learning environment, while learning discipline helps students utilize that environment optimally. However, to maximize the synergistic effect between classroom management and learning discipline, a more comprehensive and in-depth approach is needed. One

question that arises is whether good classroom management automatically improves student learning discipline. It turns out that this effect may be influenced by various factors, such as peer influence or students' levels of intrinsic motivation. Therefore, further research can delve deeper into whether there are mediating or moderating factors playing a role in this relationship. For example, whether students' learning styles or individual characteristics can moderate the effect of classroom management on their learning discipline.

To be able to optimally integrate classroom management strategies and learning discipline, teachers need to recognize the individual characteristics of students and adapt their teaching approach to their learning styles. (Aprilia et al., 2024) . For example, for more visual students, teachers can provide more visual materials such as diagrams or pictures, while for more kinesthetic students, teachers can engage them in practical activities or experiments to apply mathematical concepts. In this way, these two variables can support each other and create a more inclusive and effective learning environment.

## CONCLUSION

This study shows that effective classroom management and learning discipline play a significant role in improving mathematics learning outcomes of junior high school students in Pakue Tengah District. Good classroom management contributes 33.52% to the variation in learning outcomes, by creating a conducive learning environment and increasing student engagement. Learning discipline contributes 28.41% to learning outcomes, by helping students manage time, complete assignments, and comply with academic rules. These two factors together contribute 55.95% to student learning outcomes. To improve classroom management, teachers can implement interactive learning methods and utilize technology, such as learning applications to increase student engagement. Schools can also support student learning discipline by implementing a reward system for students who demonstrate high discipline.

This study was limited to one sub-district, so further research is recommended to cover a wider area or include additional variables such as learning motivation and learning styles. These results align with previous studies that emphasize the importance of classroom management and learning discipline in improving academic outcomes. These findings also provide input for education policymakers in designing teacher training that supports effective classroom management at all levels of education.

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