

THE INFLUENCE OF LEARNING ENVIRONMENT AND DISCIPLINE ON STUDENTS' MATHEMATICS LEARNING OUTCOMES

SMA NEGERI 1 INGIN JAYA

Sabarati¹, Irma Aryani², Rahmi³

^{1,2,3}Mathematics Education, Faculty of Teacher Training and Education
Abulyatama University, Aceh, Indonesia

*Email: irmaaryani_pmtk@abulyatama.ac.id²

Abstract: Mathematics is an important subject that plays a role in shaping students' logical and systematic thinking skills. However, the low mathematics learning outcomes at SMA Negeri 1 Ingin Jaya show that there are influencing factors, such as the learning environment and discipline. This study aims to find out how much the Influence of Learning Environment and Discipline on the Mathematics Learning Outcomes of Class X Students of SMA Negeri 1 Ingin Jaya. The type of research used is *ex post facto*. The population in this study is all students of class X of SMA Negeri 1 Ingin Jaya for the 2024/2025 Academic Year with a total of 119 students. A total of 92 students were sampled using *the Proportionate stratified random sampling technique*. The data collection techniques in this study used the following instruments: (1) learning environment questionnaire, (2) learning discipline questionnaire, (3) documentation of the results of the Final Semester Exam (UAS) mathematics. The data analysis used was multiple linear regression analysis, hypothesis testing with t-test and F test with the help of SPSS. The results of the study showed that: (1) the learning environment had a positive effect on the mathematics learning outcomes of grade X students of SMA Negeri 1 Ingin Jaya with a significant level of $0.048 < 0.05$ and t-count $> t$ -table which was $2.002 > 1.986$ with a determination coefficient value of R Square of 8.9%, then hypothesis 1 was accepted. (2) learning discipline has a positive effect on the mathematics learning outcomes of students in class X of SMA Negeri 1 Ingin Jaya with a significant level of $0.018 < 0.05$ and t-calculation $> t$ -table which is $2.420 > 1.986$ with a determination coefficient value of R Square of 10.7%, then hypothesis 2 is accepted. (3) the learning environment and learning discipline together affect the learning outcomes of class X students of SMA Negeri 1 Ingin Jaya with a significant level of $0.001 < 0.05$ and F calculated $> F$ table, namely $7.549 > 3.10$ with a determination coefficient value of R Square of 14.5%, then hypothesis 3 is accepted.

Keywords: Learning Environment; Discipline; Mathematics Learning Outcomes

1. Introduction

Education is an important means in shaping an intelligent and characterful generation (Banurea et al., 2023). Education also provides useful skills in daily life and survival (Harisah et al., 2025)

Mathematics has a huge role because it trains logical, analytical, and problem-solving skills (Manik et al., 2022). Mathematics is also needed by students to meet real-world needs (Widayati, 2022). However, many students find math difficult so their learning outcomes are low (Norida et al., 2021)

A conducive learning environment can increase student motivation and learning outcomes (Nurbayani et al., 2024). A less supportive environment actually makes students lose their enthusiasm for learning (Wahyuningsih, S & Djazari, 2020). Discipline also plays an important role in determining learning success (Rusni & Agustan, 2018). Disciplined students will be more organized in their studies and obtain better results (Hali et al., 2020).

Previous research has highlighted only one factor, namely the learning environment or discipline (Hidatullaili, 2022). The research that examined both at the same time was mostly conducted at the junior high school level (Makkarateng, 2024). Research that examines these two factors simultaneously at the high school level, especially at SMA Negeri 1 Ingin Jaya Aceh Besar, is still rare.

Based on this, this study aims to analyze the influence of learning environment and discipline on the mathematics learning outcomes of students of SMA Negeri 1 Ingin Jaya.

2. Literature Review

Learning Environment

The learning environment is an external factor that affects the course of the learning process at school (Hasibuan, 2018). This environment shapes the behavior of students and teachers in the learning process (Rusni & Agustan, 2018) and becomes a space for students to experiment and build knowledge (Mariyana & Setiasih, 2022).

The concept of the Tri Education Center divides the learning environment into families, schools, and communities (Amir et al., 2023). The family environment plays an important role as most of the student's time is spent at home (Nasution & Abdillah, 2018). The school environment is determined by the physical condition, facilities, and classroom atmosphere (Djannah, 2020) and can affect students' mental health (Winei et al., 2023). Meanwhile, the community environment provides social experiences that can increase learning motivation (Yusuf, 2018).

Learning Discipline

Learning discipline is the behavior of students to obey the rules and show responsibility in learning (Faisah et al., 2023). Discipline is important so that students are able to manage their time and achieve optimal learning outcomes (Ambarwati & Rusdarti, 2020). Discipline is also understood as an obedient and orderly attitude towards school discipline (Novita & Akhsan, 2022).

Discipline factors include internal factors such as physical and psychological conditions, as well as external factors in the form of family influences and school rules (Unaradjan, 2003). Indicators of discipline include attendance, attention to teachers, and assignment work (Arikunto, 2010). Other indicators include learning order, attention in class, and self-order in learning activities (Stand, 2004).

Learning Outcomes

Learning outcomes are student achievements after participating in learning in a certain period (Yandi Andri et al., 2023). Learning outcomes become evidence of change from ignorance to understanding (Aryani et al., 2024) and includes cognitive, affective, and psychomotor domains (Purwanti & Ani Setiani, 2019).

Learning outcome factors include internal factors such as motivation, interest, and discipline (Purwanti & Ani Setiani, 2019), as well as external factors in the form of family, school, and community (Nabillah & Abadi, 2019). Learning outcome indicators are systematically compiled from simple to complex (Ropii & Fahrurrozi, 2017).

Previous Research

Previous research has shown mixed findings. The learning environment has been shown to have an effect on mathematics learning outcomes, although the study has not touched on the discipline aspect (Nurbayani et al., 2024). Learning discipline was also shown to have an effect on mathematics learning outcomes, but the study did not review learning environment factors (Sardines & Naenu, 2021). Other studies tested the influence of the learning environment and discipline together, but it was conducted on junior high school

students so that the results were not necessarily appropriate if applied at the high school level (Makkarateng, 2024).

3. Research Methods

This type of research uses a quantitative approach with the *ex post facto*. This method was chosen because the independent variables, i.e. the learning environment and discipline, have already occurred and cannot be manipulated by the researcher (Sappaile, 2020). This study is causal-comparative to analyze the influence of free variables on bound variables, namely mathematics learning outcomes of students of SMA Negeri 1 Ingin Jaya.

The population in this study is all students of class X of SMA Negeri 1 Ingin Jaya in the even semester of the 2024/2025 school year which totals 119 students. The research sample was determined by *proportionate stratified random sampling technique*. Based on the Slovin formula with an error rate of 5%, a sample of 92 students was obtained. The sample was distributed proportionally in four classes, namely X-E1 as many as 25 students, X-E2 as many as 21 students, X-E3 as many as 21 students, and X-E4 as many as 25 students.

The variables in this study consist of independent variables, namely the learning environment and discipline and the bound variable, namely the mathematics learning outcomes of students of SMA Neferi 1 Ingin Jaya. The following is an outline of the research design that will be carried out by the researcher.

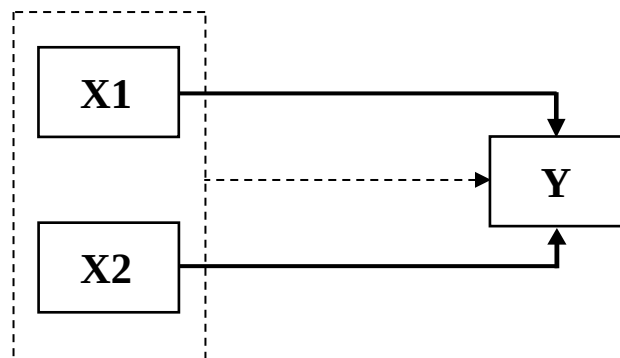


Figure 3.1 Influence Between Variables

The instruments used in the study were in the form of a learning environment questionnaire containing 25 statements, a discipline questionnaire of 15 statements, and documentation of Mathematics Final Semester Exam (UAS) scores as learning outcome data. The data analysis techniques in this study are descriptive analysis statistical techniques and inferential statistics. The data were analyzed with the help of the SPSS Statistics 27 program. The analysis is carried out through several stages. First, descriptive analysis to describe the conditions of the research variables. Second, the analysis prerequisite test which includes normality, linearity, multicollinearity, and heteroscedasticity tests. Third, the hypothesis test uses multiple linear regression analysis to determine the influence of the learning environment and discipline, both partially and simultaneously, on mathematics learning outcomes.

4. Results and Discussion

Research Results

The learning environment and discipline questionnaire that has been prepared is then tested first. The questionnaire results of the trial were then analyzed for their validity and realism. The validation results showed that for the learning environment variable, there were

24 statements that were declared valid and 1 statement that was declared invalid. Then for the discipline variable, there were 13 statements that were declared valid and 2 statements that were declared invalid. As for statements that are declared invalid, they will be replaced. Meanwhile, based on the interpretation of the reliability coefficient, it can be concluded that the value of the reliability coefficient of the learning environment questionnaire and discipline is in the very high category, thus, this research instrument is suitable for data collection.

Table 1. Descriptive Analysis Results

Variable	Sample	Min. Score.	Max Score.	Mean	Std. Deviation
Learning Environment	92	33	90	63,79	10,83
Discipline	92	31	68	43,43	6,394
Learning Outcomes	92	55	88	72,42	6,577

Source: SPSS 27 Data Processing Results

Table 1. indicates that the sample consists of 92 students. The standard deviation value of the learning environment was 10.83, discipline was 6.394, and learning outcomes were 6.577. The average score of the learning environment was 63.79, discipline was 43.43, and the learning outcome was 72.42. The maximum value of the learning environment is 90, discipline is 68, and the learning outcome is 88. The minimum score of the learning environment is 33, discipline is 31, and the learning outcome is 55.

Descriptive analysis showed that the average value of learning environment variables was 63.79 with the medium category (45.65%). The average score of learning discipline of 43.43 is also in the medium category (32.61%). Mathematics learning outcomes have an average of 72.42 with the medium category (45.65%). A summary graph of the results of the analysis is shown in Figure 1.

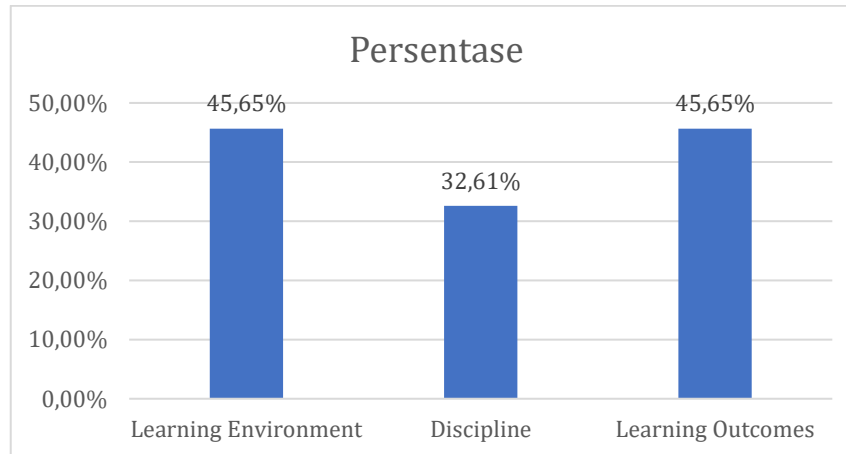


Figure 1. Variable Percentage Category Summary Chart

Figure 1. It shows that the three research variables are in the medium category. The student learning environment is quite supportive but not optimal. Student learning discipline is also at a moderate level so that its influence on learning outcomes has not been maximized. Mathematics learning outcomes are still dominated by the medium category, so learning conditions need to be improved.

Table 2. Summary of Results of Multiple Linear Regression Test

Variables/Tests	Value	Sig.	Information
Learning Environment	t = 2.002	0,048	Significant effect
Discipline	t = 2.420	0,018	Significant effect
Simultaneous Test (F)	F = 7.549	0,001	Significant effect
Coefficient of Determination	R ² = 0.145	-	Contribution 14.5%

Source: SPSS 27 Data Processing Results

Based on Table 2. showed that both the learning environment and discipline partially had a significant effect on mathematics learning outcomes (sig. < 0.05). Simultaneously, both variables also had a significant effect (sig. 0.001) with a contribution of 14.5%.

Discussion

The results of this study show that the three research variables are dominated by the medium category. This means that even though students have a fairly good learning environment and discipline, the achievement of mathematics learning outcomes is still not optimal.

Regression analysis shows that the learning environment has a significant effect on mathematics learning outcomes. The more conducive the student learning environment, the higher the learning outcomes achieved. These findings are in accordance with the research of Nurbayani et al. (2024) which affirms the important role of the learning environment.

Learning discipline also has a significant effect on mathematics learning outcomes. Students who show up on time, work on assignments regularly, and adhere to school rules tend to have better learning outcomes. These results support the findings of Sardin & Naenu (2021) on the importance of discipline in improving mathematics learning achievement.

Simultaneously, the learning environment and discipline have an influence of 14.5% on mathematics learning outcomes. The rest are influenced by other factors such as learning methods and others that are not studied in this study. This supports the view of Makkarateng (2024) that learning success is the result of the interaction of external factors (environment) and internal factors (student discipline).

Thus, to improve students' mathematics learning outcomes, a comprehensive strategy is needed by improving the learning environment while instilling a strong learning discipline.

5. Conclusions and Suggestions

Conclusion

This study shows that the learning environment and learning discipline of SMA Negeri 1 Ingin Jaya students partially or simultaneously have a significant effect on mathematics learning outcomes. The three variables are in the medium category, so the quality of the learning environment and student discipline need to be improved so that mathematics learning outcomes are more optimal.

Suggestion

Teachers and schools need to create a comfortable learning environment and instill discipline through positive rules and habituation, while students are encouraged to be more regular in learning and doing assignments. Further research can add other variables or learning methods to enrich the results of the study.

Bibliography

- Ambarwati, N., & Rusdarti. (2020). The Influence of Learning Discipline, School Environment, and Learning Facilities on Learning Outcomes. *Economic Education Analysis Journal*, 9(3), 831–843.
- Amir, M. R., Firmansah, R. F., Sidik, A., Qubaila, A., Zidna, S., Azhar, M., Izzah, Z. L., Farohi, S., Masruroh, A., Alfatah, M. R., Nisa, M., Afifah, N., Henilalita, R., & Nadifah, M. (2023). *Become an Effective and Strategic Education Leader*.
- Arikunto, S. (2010). *Fundamentals of Educational Evaluation*. The Earth of Scripts.
- Aryani, I., Rahmi, R., Murni, M., Musriandi, R., Fitriyasni, F., & Maulida, M. (2024). The application of the Search, Solve, Create, and Share (SSCS) learning model to improve the learning outcomes of junior high school students. *Journal of Educational Dedication*, 8(1), 459–466. <https://doi.org/10.30601/dedikasi.v8i1.4779>
- Banurea, R. D. U., Simanjuntak, R. E., Siagian, R., & Turnip, H. (2023). Educational Planning. *Journal of Social Education and Humanities*, 2, 88–99.
- Djannah, M. (2020). The influence of mental health in the midst of the Covid-19 outbreak on the improvement of student learning achievement in elementary school. *National Seminar on Information Systems (SENASIF)*, 4(1), 2403–2414. <https://jurnalfti.unmer.ac.id/index.php/senasif/article/view/321>
- Faisah, E., Padilah, E., & Patras, Y. E. (2023). The Influence of Students' Learning Interests and Learning Discipline on Mathematics Learning Outcomes. *Journal of Educational Management*, 11(1), 006–013. <https://doi.org/10.33751/jmp.v11i1.7698>
- Hali, F., A. M, R., & Farman. (2020). *Improving Learning Outcomes of Mathematics Students in Polynomial Topic Through the Reciprocal Teaching Approach in Class XI IA1 SMAN 2 Kendari*.
- Harisah, Z., Aryani, I., Rahmi, Musriandi, R., & Hasanah. (2025). Analysis of Numeracy Literacy Ability of High School Students in Mathematics Learning. *Journal of Education Dedication*, 9(2), 1059–1068.
- Hasibuan, A. A. (2018). The Contribution of the Learning Environment and Learning Process to Student Learning Achievement in School. *Journal of Research*, 25(2), 1–20.
- Hidatullaili, W. (2022). Cultivating Character of Love for the Environment Through Social Studies Learning Sub-Theme of Environmental Ethics of SMP Negeri 1 Balong Ponorogo. *Electronic Theses, Ponorogo State Islamic Religious Institute*, 36. <http://etheses.iainponorogo.ac.id/id/eprint/20641>
- Manik, H., C B Sihite, A., Sianturi, F., Panjaitan, S., & Hutaauruk, A. J. B. (2022). The Challenge of Becoming a Mathematics Teacher with an Independent Learning Curriculum during the Omicron Covid-19 Pandemic. *Edumaspul: Journal of Education*, 6(1), 328–332. <https://doi.org/10.33487/edumaspul.v6i1.3048>
- Mariyana, R., & Setiasih, O. (2022). Arrangement of an integrated learning environment to increase the potential of children's plural intelligence. *Pedagogy*, 15(3), 241. <https://doi.org/10.17509/pdgia.v15i3.11020>
- Nabillah, T., & Abadi, A. P. (2019). Factors that cause low student learning outcomes. *Esiomadika (from the URL and writing format, it looks like this is the name of the journal)*, 659. <http://journal.unsika.ac.id/index.php/sesiomadika>
- Nasution, H. S., & Abdillah. (2018). *Guidance and Counseling. Concepts, Theories, and Applications*.
- Norida, R. N. P., Aryani, I., & Musriandi, R. (2021). Perception of Mathematics Education Students on Online Learning in Aceh. *SEMDI UNAYA-2021*, 10(1), 236–246. <https://doi.org/10.33373/pythagoras.v10i1.2895>

- Novita, L., & Akhsan, S. M. (2022). The Relationship of Learning Discipline with Mathematics Learning Outcomes. *PGSD Journal UNIGA*, 1(1), 17–26. <https://doi.org/10.52434/jpgsd.v1i1.1589>
- Nurbayani, A., Amrullah, Kurniawan, E., & Hikmah, N. (2024). The Influence of Learning Environment and Students' Learning Interests on Mathematics Learning Outcomes in Class X Students of SMAN 1 Kediri Ajaran 2023/2024. *Pendas: Scientific Journal of Basic Education*, 09, 4098–4110.
- Purwanti, R. S., & Ani Setiani. (2019). Efforts to Improve Economic Learning Outcomes in Understanding the Formation of Market Balance and Market Structure through the Application of the Discovery Learning Learning Model in Class X Social Studies 2 Students of SMA Pasundan 1 Bandung. *Garda Guru*, 01(2), 37–47.
- Ropii, M., & Fahrurrozi, M. (2017). Evaluation of Learning Outcomes. Evaluation of Learning Outcomes. In *Yogyakarta: Student Library*.
- Rusni, & Agustan. (2018). The Influence of Learning Discipline on Students' Mathematics Learning Outcomes in Elementary Schools. *Journal of Basic Education Research*, 1(1), 1–9.
- Sappaile, B. I. (2020). Ex-Post Facto Research Concept. *Journal of Mathematics Education*, 1, 1–16.
- Sardin, S., & Naenu, B. (2021). The Influence of Learning Discipline on Mathematics Learning Outcomes of Grade VII Students of SMP Negeri 3 Baubau. *Academic Journal of Mathematics Education*, 7, 100–107. <https://doi.org/10.55340/japm.v7i2.420>
- Stand, T. (2004). *The Role of Discipline in Student Behavior and Achievement* (K. Wibowo (ed.)). PT Grasindo.
- Wahyuningsih, S & Djazari, M. (2020). The Influence of School Learning Environment and Learning Habits on the Learning Achievement of Accounting Students in Class XI IPS SMA Negeri 1 Srandakan. *Indonesian Accounting Education Review*, 5(3), 137–160.
- Widayati, E. W. (2022). P Mathematics Learning in the Era of "Freedom of Learning", A Challenge for Mathematics Teachers. *Sepren*, 4(01), 01–10. <https://doi.org/10.36655/sepren.v4i01.770>
- Winei, A. A. D., Ekowati, Setiawan, A., Jenuri, Weraman, P., & Zulfikhar, R. (2023). The Impact of School Environment on Students' Learning Outcomes and Mental Health. *Journal on Education*, 06(01), 317–327. <https://jonedu.org/index.php/joe/article/download/2945/2491>
- Yandi Andri, Putri, A. N. K., & Putri, Y. S. K. (2023). Factors that affect student learning outcomes (literature review). *Journal of Cyber Education Nusantara*, 1(1), 13–24.
- Yusuf, M. (2018). Introduction to Education. *IAIN Palopo Campus Publishing Institution*, p.01. <https://core.ac.uk/download/pdf/198238855.pdf>