Education Studies and Teaching Journal (EDUTECH)
Vol 2 (3) 2025 : 492-502

THE INFLUENCE OF LOGICAL MATHEMATICAL INTELLIGENCE, LEARNING INDEPENDENCE AND LEARNING MOTIVATION ON MATHEMATICS LEARNING OUTCOMES OF GRADE XI STUDENTS OF SMA NEGERI 1 MERAUKE

PENGARUH KECERDASAN MATEMATIS LOGIS, KEMANDIRIAN BELAJAR DAN MOTIVASI BELAJAR TERHADAP HASIL BELAJAR MATEMATIKA SISWA KELAS XI SMA NEGERI 1 MERAUKE

Fredek Batsira [1], Bettisari Napitulu [2], Irfan Wahyudi [3]
Faculty of Teacher Training and Education, Cenderawasih University, Jayapura, Papua[1,2,3]
*batsirafredy438@gmail.com[1]

**Corresponding Author*

ABSTRACT
Intelligence, learning independence and learning motivation on students' mathematics learning outcomes. The type of research used is ex post facto research. The population in this study were all students of grade XI of SMA Negeri 1 Merauke in the 2024/2025 academic year with a total of 398 students. The research sample to be used was 199. Data collection techniques used in this study were questionnaires, tests and documentation. Data analysis techniques in this study include descriptive and inferential data analysis. The results of this study indicate that there is an insignificant effect between mathematical-logical intelligence, learning independence and learning motivation on the mathematics learning outcomes of grade XI students of SMA Negeri 1 Merauke. This is because the results of the f-test obtained Fcount (5.433)> Ftable 3.89 and a significance value (0.001) <0.05.
Keywords: Learning Outcomes Learning Motivation Learning Independence Logical Mathematical Intelligence

ABSTRAK
Kecerdasan, kemandirian belajar, dan motivasi belajar terhadap hasil belajar matematika siswa. Jenis penelitian yang digunakan adalah penelitian ex post facto. Populasi dalam penelitian ini adalah seluruh siswa kelas XI SMA Negeri 1 Merauke tahun ajaran 2024/2025 dengan jumlah 398 siswa. Sampel penelitian yang digunakan sebanyak 199 siswa. Teknik pengumpulan data dalam penelitian ini adalah angket, tes, dan dokumentasi. Teknik analisis data dalam penelitian ini meliputi analisis data deskriptif dan inferensial. Hasil penelitian ini menunjukkan bahwa terdapat pengaruh yang tidak signifikan antara kecerdasan logis-matematis, kemandirian belajar, dan motivasi belajar terhadap hasil belajar matematika siswa kelas XI SMA Negeri 1 Merauke. Hal ini karena hasil uji F diperoleh Fhitung (5,433) > Ftabel (3,89) dan nilai signifikansi (0,001) < 0,05.
Kata Kunci: Hasil Belajar, Motivasi Belajar, Kemandirian Belajar, Kecerdasan Logis Matematis

1. INTRODUCTION

Education is a conscious effort to achieve specific goals. Education plays a crucial role in improving the quality of human resources. This aligns with the national education goals outlined in Law No. 20 of 2003, Chapter II, Article 3, concerning the National Education System. The law states that national education functions to develop abilities and shape the character and civilization of a dignified nation in order to advance the nation's intellectual life. Furthermore, education aims to optimize the potential of students to become individuals who are faithful and devoted to God Almighty, possess noble character, are healthy, knowledgeable, skilled, creative, independent, and become democratic and responsible citizens.

The desired change is reflected in the success of each student. Therefore, education needs to be well-managed, both in terms of quality and quantity. This can be seen through student learning outcomes. Mathematics learning outcomes are influenced by various factors,

both internal and external. According to Slameto (2020:146), there are several internal factors, one of which is psychological factors, including intelligence level, attitude, talent, interest, discipline, learning independence, and learning motivation.

2. LITERATURE REVIEW

According to Mubeen, J (2022), logical-mathematical intelligence is a combination of arithmetic and logical skills, enabling students to solve problems logically. Logical-mathematical intelligence aligns with mathematics learning that prioritizes arithmetic and logical skills. According to Syamsu & Nurihsan (Triwinarni, Fauzi, and Monawati, 2019), logical-mathematical intelligence is an intelligence that includes the ability to explain mathematically, think logically, think deductively and inductively, and be sharp in creating logical patterns and relationships. Logical-mathematical intelligence, according to Yaumi (Zulfairanatama and Hadi, 2019), is the ability related to reasoning, recognizing patterns, and understanding certain rules. This ability is often associated with critical thinking skills. Meanwhile, according to Lwin (2019), mathematical-logical intelligence is the ability to process numbers, perform calculations, recognize patterns, and think logically and scientifically. According to Visser, Ashton & Vernon (Novitasari, Rahman, and Alimuddin 2020), mathematical-logical intelligence can be defined as the ability to understand problems, perform mathematical operations logically and analytically, and conduct scientific investigations.

According to Asrori (2019: 121), learning independence is a behavior possessed by someone who is able to take the initiative to fulfill their needs without relying on others and does so responsibly. Independent learning is very different from restructured learning because it is deliberately structured. According to Jayanti and Widyaninggar (2019), learning independence is a change in a person resulting from experience and practice, without relying on others. Meanwhile, according to Dedyerianto (2019), learning independence is a student's behavior in achieving their desired learning goals without relying on others. In this case, students can develop learning strategies to carry out their tasks and responsibilities effectively and independently. Learning independence stems from within a student, who is able to manage their own learning without assistance from others. The learning process of each student or learner is always directed toward becoming an independent learner, and to become independent, an individual must learn, thus achieving learning independence.

Learning motivation consists of two words with their own meanings: motivation and learning. According to McDonald (Adhetya, Iin, & Sari, 2020), motivation is a change in energy that occurs in an individual, characterized by the emergence of feelings and reactions or actions to achieve specific goals. Meanwhile, learning motivation, according to Slameto (Adhetya, Iin, & Sari, 2020), is a process of striving to achieve behavioral changes. According to Ridwan (2019), motivation is defined as the energy within individuals that drives them to undertake explicit training with explicit goals. Learning motivation, according to Uno (2019), is essentially an internal and external drive for students who are learning. Through learning motivation, students will experience behavioral changes that are motivated to undertake learning activities. According to Novalinda (2019), motivation is divided into two types, namely: 1) Intrinsic motivation, which is motivation that is included in the learning situation and fulfills individual needs.

3. METHODS

The research used an ex post facto approach. It was conducted at SMA Negeri 1 Merauke, Jalan Biak, Merauke, South Papua. The study was conducted during the even semester of the 2024/2025 academic year. The population was all 11th-grade students of SMA Negeri 1 Merauke in the 2024/2025 academic year, totaling 398 students.

Sampling in this study was conducted using Proportional Random Sampling, which proportionally selects subjects from each stratum or region. Then, a simple random sampling

technique was employed, with each population having an equal chance of being selected. The sample size for this study was 199 students. The variables used in this study were mathematical-logical intelligence, learning independence, and learning motivation as independent variables, and mathematics achievement as dependent variable.

The data collection technique used in this study to obtain data on mathematical-logical intelligence, learning independence, and student learning motivation was a questionnaire. There are three questionnaire sheets used in this study, namely: a logical mathematical intelligence questionnaire, a learning independence questionnaire, and student learning motivation. The rating scale contained in the questionnaire includes 4 possible answers for the Learning Independence questionnaire, namely 4 (always), 3 (often), 2 (sometimes), 1 (never). Meanwhile, the results of the summative assessment are the results of mathematics learning. Data analysis techniques in this study include descriptive and inferential data analysis. The results of the descriptive statistical analysis presented in this study are Mean, Median, Mode, Standard Deviation, Highest Score and Lowest Score. Next, compile a frequency distribution.

4. RESULTS AND DISCUSSIONS

4.1. Result

Table 1.
Description of Data on Logical Mathematical Intelligence, Learning Independence, Learning Motivation and Mathematics Learning Outcomes

Statistics

		Mathematical-Logical Intelligence	Learning Independence	Motivation to learn	Learning outcomes
N	Valid	199	199	199	199
Missing		0	0	0	0
Mean		81.2814	70.9296	61.0603	82.2362
Median		82.0000	71.0000	61.0000	82.0000
Mode		90.00	70.00	62.00	80.00
Std. Deviation		7.77013	4.63900	5.22681	3.73619
Variance		60.375	21.520	27.320	13.959
Range		40.00	27.00	25.00	16.00
Minimum		60.00	55.00	49.00	74.00
Maximum		100.00	82.00	74.00	90.00

From the table above, it can be seen that the data of logical mathematical intelligence, from 199 respondents obtained the minimum value data, namely 60 and the maximum data is 100, with the mean of the 199 respondents being 81.28, the median is 82, and the mode is 90, in addition, the variance is 60.375 and the standard deviation is 7.770. The learning independence data from 199 respondents obtained the minimum value data, namely 55 and the maximum data, namely 82, with the mean of the 199 respondents being 70.92, the median is 71, and the mode is 70, in addition, the variance is 21.520 and the standard deviation is 4.639. And the learning motivation data from 199 respondents obtained the minimum value data of 49 and the maximum data of 74, with the mean of the 199 respondents being 61.06, the median of 61.00, and the mode of 62, in addition to that, the variance was obtained as 27.320 and the standard deviation was 5.226. Meanwhile, for the mathematics learning outcomes data, the minimum value was 74 and the maximum value was 90,

with a mean of 82.24, a median of 82 and a mode of 80. In addition, the variance was obtained as 13.959 and a standard deviation of 3.736.

Logical mathematical intelligence data is presented in the form of a bar chart, the frequency of logical mathematical intelligence data is shown in Figure 1:

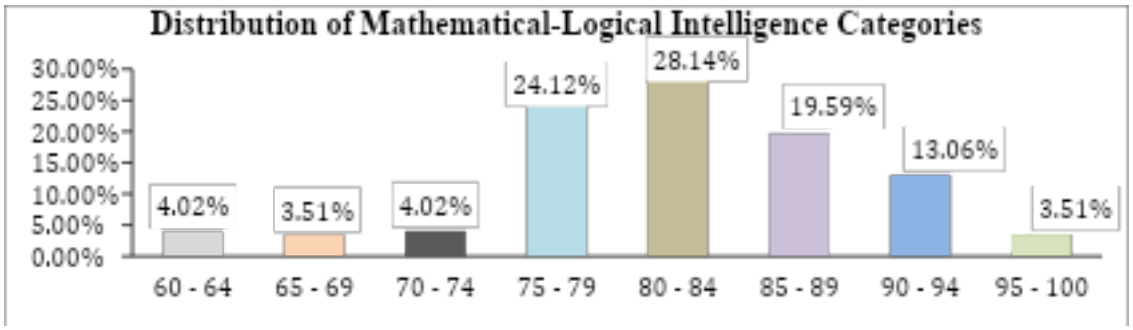

Figure 1.
Frequency of Intervals of Mathematical-Logical Intelligence Data

Figure 1 shows that the highest frequency of logical mathematical intelligence data is found in the 80-84 data interval, at 28.14%. Meanwhile, the lowest frequency of logical mathematical intelligence data is found in the 65-69 and 95-100 data intervals, at 3.51%.

The trend of the logical mathematical intelligence variable was determined by finding the ideal mean value (Mi) and the ideal standard deviation (SDi). Based on these references, the ideal mean for the logical mathematical intelligence variable is 80. The ideal standard deviation is 8. From the calculations above, the students can be categorized into five classes, as shown in Table 3 below:

Table 2.
Distribution of Mathematical-Logical Intelligence Categories

Number	Score	Frequency		Category
		F	%	
1	$92 < X$	13	6,5	Very high
2	$84 < X \leq 92$	25	12,6	Tall
3	$76 < X \leq 84$	79	39,9	Currently
4	$68 < X \leq 76$	75	37,7	Low
5	$X \leq 68$	7	3,5	Very Low

Based on the table, 13 students (6.5%) had very high logical mathematical intelligence, 25 students (12.6%) had high logical mathematical intelligence, 79 students (39.9%) had moderate logical mathematical intelligence, 75 students (37.7%) had low logical mathematical intelligence, and 7 students (3.5%) had very low logical mathematical intelligence.

The learning independence data is presented in the form of a bar chart, with the frequency of learning independence data shown in Figure 2.

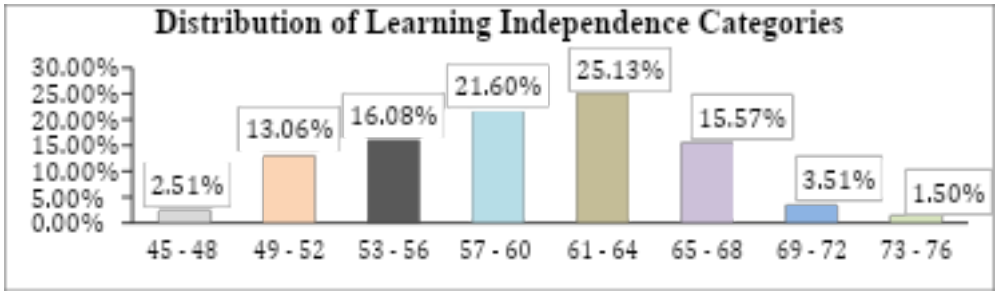

Figure 2.
Frequency of Learning Independence Data Intervals

Figure 2 shows that the Learning Independence data interval with the highest frequency is 61-64, at 25.13%. Meanwhile, the learning independence data interval with the lowest frequency is 73-76, at 1.50%.

The trend of the learning independence variable was determined by finding the ideal mean (Mi) and the ideal standard deviation (SDi). Based on these references, the ideal mean of the learning independence variable is 60 and the ideal standard deviation is 5.4. From the calculations above, learning independence is categorized into five classes, as seen in Table 4 below:

Table 3.
Distribution of Learning Independence Categories

Number	Score	Frequency		Category
		F	%	
1	$68{,}1 < X$	11	11,50	Very high
2	$62{,}7 < X \leq 68{,}1$	46	23,11	Tall
3	$57{,}3 < X \leq 62{,}7$	92	46,23	Currently
4	$51{,}9 < X \leq 57{,}3$	36	18,09	Low
5	$X \leq 51{,}9$	14	14,50	Very Low

Based on the table, 11 students (11.50%) were in the very high learning independence category, 46 students (23.11%) were in the high learning independence category, 92 students (46.23%) were in the moderate learning independence category, 36 students (18.09%) were in the low learning independence category, and 14 students (14.50%) were in the very low learning independence category.

Learning motivation data is presented in the form of a bar chart, with the frequency of learning motivation data shown in Figure 3.

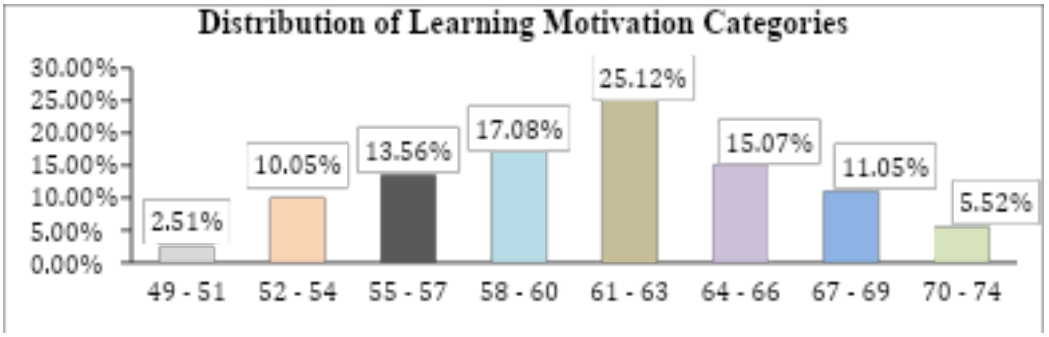

Figure 3.
Frequency of Learning Motivation Data Intervals

Figure 3 shows that the learning motivation data interval with the highest frequency is 61-63, at 25.12%. Meanwhile, the learning motivation data interval with the lowest frequency is 49-51, at 2.51%.

The learning motivation variable's trend is determined by finding the ideal mean (Mi) and the ideal standard deviation (SDi). Based on these references, the ideal mean for the learning motivation variable is 61.5 and the ideal standard deviation is 5. From the calculations above, learning motivation is categorized into five classes, as seen in Table 5 below:

Table 4.
Distribution of Learning Motivation Categories

Number	Score	Frequency		Category
		F	%	
1	$69 < X$	11	5,5	Very high
2	$64 < X \leq 69$	52	26,13	Tall
3	$59 < X \leq 64$	73	36,6	Currently
4	$54 < X \leq 59$	45	22,6	Low
5	$X \leq 54$	19	9,5	Very Low

Based on the table, 11 students (5.5%) were classified as having very high learning motivation, 52 students (26.13%) were classified as having high learning motivation, 73 students (36.6%) were classified as having moderate learning motivation, 45 students (22.6%) were classified as having low learning motivation, and 19 students (9.5%) were classified as having very low learning motivation.

The learning outcome data is presented in the form of a frequency bar chart, as shown in Figure 4.

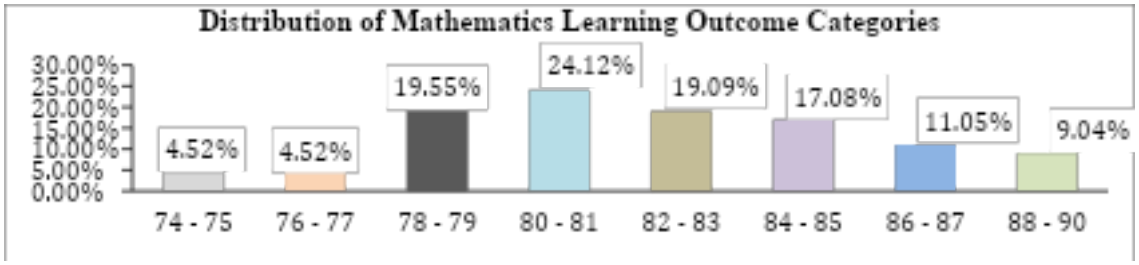

Figure 4.
Frequency of Interval Data on Mathematics Learning Outcomes

Figure 4 shows that the learning outcome data interval with the highest frequency is the 80-81 interval, with 24.12%. Meanwhile, the mathematics learning outcome data intervals with the lowest frequency are the 74-75 and 76-77 intervals, with 4.52%.

The trend of the learning outcome variable is determined by finding the ideal mean (Mi) and the ideal standard deviation (SDi). Based on these references, the ideal mean of the learning outcome variable is 82 and the ideal standard deviation is 3.2. From the calculations above, the learning outcomes are categorized into five classes, as seen in Table 4.4 below:

Table 5.
Distribution of Learning Outcome Categories

Number	Score	Frequency		Category
		F	%	
1	$86{,}8 < X$	18	9	Very high
2	$83{,}6 < X \leq 86{,}8$	41	20,6	Tall
3	$80{,}4 < X \leq 83{,}6$	65	32,6	Currently
4	$77{,}2 < X \leq 80{,}4$	61	30,6	Low
5	$X \leq 77{,}2$	14	7	Very Low

Based on the table, 18 students (9%) had very high learning outcomes, 41 students (20.6%) had high learning outcomes, 65 students (32.6%) had moderate learning outcomes, 61 students (30.6%) had low learning outcomes, and 14 students (7%) had very low learning outcomes.

After the assumption test was met, the next step was to test the hypothesis regarding the influence of the three independent variables: logical-mathematical intelligence, learning independence, and motivation on the dependent variable, namely the learning outcomes of 11th-grade students at SMA Negeri 1 Merauke.

Table 6.
Results of the t-test

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.563	20.704		.269	.788
	Mathematical-Logical Intelligence	.085	.051	.119	1.667	.097

Learning Independence	.340	.201	.130	1.689	.093
Motivation to learn	.579	.279	.155	2.078	.039

a. Dependent Variable: Mathematics Learning Outcomes

Based on the statistical results of the t-test between logical mathematical intelligence and student learning outcomes with db = 199, the t count was 1.667 and the significance value was 0.97 greater than 0.05 and the t table was 1.653 so that H_0 was accepted. Learning independence and learning outcomes obtained a t count of 1.689 and a significance value of 0.93 greater than 0.05 and the t table was 1.653 so that it was accepted. Learning motivation and learning outcomes obtained a t count of 2.078 and a significance value of 0.39 greater than 0.05 and the t table was 1.653 so that H_0 was rejected

Table 7.
Results of the f test

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	213.190	3	71.063	5.433	.001[b]
	Residual	2550.709	195	13.081		
	Total	2763.899	198			

a. Dependent Variable: Mathematics Learning Outcomes
b. Predictors: (Constant), Learning Motivation, Mathematical-Logical Intelligence, Learning Independence

Based on the statistical results of the F test on the variables of logical mathematical intelligence, learning independence, and learning motivation, the calculated F was 5.433 with db = 199. In addition, the significance value (0.001) was smaller than 0.05, so H_0 was rejected.

Based on the results of SPSS data processing, the bo value was 5.563, the b1 value was 0.085, b2 was 0.340, and b3 was 0.579. Therefore, the regression equation obtained to present the relationship between logical mathematical intelligence (X1), learning independence (X2), and learning motivation (X3) on learning outcomes (Y) is as follows:

$$Y = 5{,}563 + 0{,}085 + 0{,}340 + 0{,}579X3 + e$$

4.2. DISCUSSION

The results of the first hypothesis test indicate that logical mathematical intelligence partially has a significant effect on the mathematics learning outcomes of eleventh-grade students at SMA Negeri 1 Merauke. The results of the hypothesis test indicate that logical mathematical intelligence in mathematics is 1.667, meaning that logical mathematical intelligence does not affect mathematics learning outcomes. In other words, if logical mathematical intelligence is low, learning outcomes are low, and vice versa, if logical mathematical intelligence is high, learning outcomes are high. The results of the research that has been conducted indicate low logical mathematical intelligence and high learning outcomes. This is in line with the research conducted by Vera Miska Yuliana (2019), whose results stated that there is a positive effect of logical mathematical intelligence on mathematics learning outcomes.

The results of the second hypothesis test indicate that student learning independence in mathematics learning partially does not significantly affect mathematics learning outcomes. Thus, the second hypothesis, which states that there is a significant effect of learning independence on mathematics learning outcomes of eleventh-grade students at SMA NEGERI 1 Merauke, is proven. This aligns with previous research conducted by Mayang Gadih Ranti,

Indah Budiarti, and Benny Nawa Trisna (2020), which found a significant positive effect between student learning independence and mathematics learning outcomes. The results of this study indicate a significant effect of learning independence on mathematics learning outcomes. This is due to the psychological/characteristics of most students in the study, their awareness of the importance of learning, and their competitiveness.

The results of the third hypothesis test indicate that student learning motivation in mathematics has a partial and significant effect on mathematics learning outcomes. Therefore, the third hypothesis, which states a significant effect of learning motivation on mathematics learning outcomes in grade XI SMA NEGERI 1 Merauke, is confirmed. This aligns with previous research conducted by Mayang Gadih Ranti, Indah Budiarti, and Benny Nawa Trisna (2020), which found a significant positive effect between student learning motivation and mathematics learning outcomes. The results of this study indicate a significant effect of learning motivation on mathematics learning outcomes.

The results of the fourth hypothesis show that logical mathematical intelligence, learning independence and learning motivation together have a significant influence on the mathematics learning outcomes of class XI students of SMA Negeri 1 Merauke. The contribution of logical mathematical intelligence, learning independence and learning motivation together has an insignificant influence on mathematics learning outcomes of 5.433. The results of the research that has been conducted show that there is an influence of logical mathematical intelligence, learning independence and learning motivation on mathematics learning outcomes.

5. CONCLUSION

Based on the results of the research and discussion, the researcher can draw the following conclusions: 1) There is no significant positive influence between logical mathematical intelligence on mathematics learning outcomes of class XI SMA Negeri 1 Merauke. This is because the t-count value obtained is 1.667 and the significance value is 0.97 > 0.05. 2) There is no significant positive influence between learning independence on mathematics learning outcomes of class XI SMA Negeri 1 Merauke. This is because the t-count value obtained is 1.689 and the significance value is 0.93 > 0.05. 3) There is a significant positive influence of learning motivation on mathematics learning outcomes of class XI SMA Negeri 1 Merauke, with the T-test statistics on learning motivation on mathematics learning outcomes obtained T-count 2.078 and a significance value of 0.39 > 0.05. 4) There is a significant positive influence between logical mathematical intelligence, learning independence and learning motivation on the mathematics learning outcomes of class XI SMA Negeri 1 Merauke, with the F test statistics on the variables of logical mathematical intelligence, learning independence and learning motivation on mathematics learning outcomes obtained F count (5.433) and a significance value (0.01) < 0.05.

6. ACKNOWLEDGEMENT

Starting with Confidence, Executing with Sincerity, Finishing with Happiness. Thank you, Lord Jesus Christ, for always giving me health. Thank you to my mother for her constant prayers for me. Thank you also to all those whom I cannot mention individually.

7. REFERENCES

Adhetya, C., Iin, D. L., & Sari, P. L. (2020). High School Students' Learning Motivation in Online Learning During the Covid-19 Pandemic. Journal of Islamic Education, 126.

Arikunto, S. (2020). Research Procedures: A Practical Approach. Jakarta Rineka Cipta

Armstrong, T. (2019). Multiple Intelligences in the Classroom. Jakarta. PT. Rineka Cipta.

Arsyil, W. (2020). The Relationship between Learning Motivation and Mathematics Learning Achievement. Scientific Journal of Education, 29

Asih, R, S., Riska N, & Alim, J, A (2023). The Influence of Student Learning Motivation and Learning Independence on Elementary School Student Learning Outcomes. Tambusai Journal of Education. ISSN: 2614-6754 (print), ISSN: 2614-3097 (online).
Asrori, M (2019). Adolescent Psychology: Student Development. Jakarta Bumi Aksara
Basir, (2020). Scientific Writing on Education. Tulip Journal ISSN: 2338-6126
Bethony, M. (2023). The Influence of Logical-Mathematical Intelligence, Visual-Spatial Intelligence, and Learning Motivation on Mathematical Problem-Solving Ability. Journal of Mathematics Education, Vol. 9 No. 2 (2024).
Darmawan, H. (2020). Improving Students' Science Learning Achievement in the Learning Cycle Model Using Energy and Its Transformation. Trapsila: Journal of Elementary Education, 26.
Dedyerianto. (2019). The Influence of the Internet and Social Media on Student Learning Independence and Outcomes. Journal of Educational Studies, Volume 12 No. 2, 2019.
Desmita. (2019). Student Development Psychology. Bandung. Pt Remaja Rosdakarya
Hoer. (2020). The Influence of Interpersonal Intelligence on Students' Mathematics Learning Outcomes. Journal of Islamic Education Management, 2(1), 2020.
Jais, E (2020) The Influence of Learning Independence and Learning Motivation on Student Achievement in Grade VIII A of SMP Negeri 1 Lakudo. Academic Journal of Mathematics Education ISSN: 2442-9864
Kamila. (2023). The Relationship Between Mathematical Intelligence and Mathematics Learning Discipline in Higher Grade Students at Madrasah Ibtidaiyah Ma'arif 30 Bustanul Ulum Ambulu Jember. journal.unpas.ac.id.
Kurniawan Dhani. (2019). The Relationship Between Learning Motivation and Learning Independence and Its Impact on Students' Mathematical Problem-Solving Ability Using SEM (Structural Equation Modeling) Analysis. JUBIKOPS (Journal of Guidance and Counseling), ISSN: 2097-7366.
Maria, F.W. & Yuli, P. 2019. The Relationship Between Learning Independence and Mathematics Learning Outcomes. Article Metrics
Masridah, & Dewi, N. S. (2024). Analysis of Multiple Intelligences in Mathematics in Grade 6. Journal of Education and Development Research, E-ISSN: 3025-2393. P-ISSN: 3025-2385.
Mayang Gadih Ranti, I. B. (2019). The Effect of Self-Regulated Learning on Student Learning Outcomes in the Algebraic Structure Course. Math Didactic: Journal of Mathematics Education, 76.
Mubeen, J (2022). Mathematical Intelligence; A Story About Human Superiority Over Machines. Publisher: Alvabet
Mulyadi, M., & Abd, S. (2020). Factors Shaping Student Learning Independence. Al-Liqo: Journal of Islamic Education, 202.
Ningsih, & Nurahmah. (2019). The Effect of Self-Regulated Learning and Parental Attention on Mathematics Learning Achievement. Formative Journal, 6(1): 73-84, 2016.
Novalinda. (2019). Application of the Problem-Based Learning Model in Improving Science Motivation and Learning Outcomes. Educativo: Jurnal Education, Vol. 1, No. 1, MAY (2019), Pages: 334-341.
Octavia, S. A. (2020). Learning Motivation in Adolescent Development (1st). Yogyakarta: CV Budi Utama.
Putra. (2019). The Influence of Logical-Mathematical Intelligence and Emotional Intelligence on Mathematics Learning Outcomes of Eighth Grade Students of SMP Negeri 9 Tarakan. Jurnal Florea, ISSN: 2337-9049, e-ISSN. 2502440.
Rahmadani, A., Rudi., Risnawita & Rahmat, T. (2023) The Effect of Mathematical-Logical Intelligence and Intrapersonal Intelligence on Students' Mathematics Learning Outcomes. Journal on Education E-ISSN: 2654-5497, P-ISSN: 2655-1365

Rahmi, R., Delyana, H., Melisa, M., Suryani, M., Gusnita., Rizka, M. Aprilia, W & Okky (2021) The Effect of Learning Independence and Learning Motivation Through TPSQ Learning on Vocational High School Students' Concept Understanding Ability. AKSIOMA Journal of Mathematics Education Study Program

Ranti, G. M., Budiarti, I., & Trisna, N. B. (2020). THE EFFECT OF SELF-REGULATED LEARNING INDEPENDENCE. Journal of Mathematics Education, e-ISSN 2579-3977.

Ridwan, M. M. (2019). The Influence of Leadership Style on Librarian Work Motivation at the Muhammadiyah University of Yogyakarta Library: A Study of the Application of the Path-Goal Leadership Style. Article, Vol. 11 No. 1 (2019).

Safitri, F. S. (2021). The Influence of Student Learning Independence and Parental Educational Background on Fourth Grade Learning Outcomes at Al-Madina Elementary School, Purworejo. Paris Langkis Journal, Vol. 2 No. 1 (2021).

Septyaningsih, (2021). The Influence of Students' Logical-Mathematical Intelligence and Linguistic Intelligence on. Prosiding Seminar Nasional Pendidikan Matematika IV (Sandika IV) Volume 4 Nomor 1