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The Effect of Spatial, Logical Mathematical and Emotional Intelligence on Students' Mathematics Learning Achievement

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Abstrak. *The aim of this study is to assess the effectt and respective contributions of spatial, logical mathematical, and emotional intelligence on students' mathematics learning achievement. This research adopts an ex post facto methodology with a quantitative approach. The study population consisted of 240 ninth-grade students at MAN 1 Medan. A probability sampling technique, specifically random sampling, was employed to select a sample of 70 students from classes IX-5 and IX-7 at MAN 1 Medan. Data collection involved using spatial intelligence tests, logical-mathematical intelligence questionnaires, and emotional intelligence assessments. Mathematics learning achievement data were gathered from students' final exam scores in the even semester. The data were analyzed using descriptive statistics and inferential statistics, employing multiple linear regression analysis as the research design. The findings of the study indicate the following: (1) There is a statistically significant positive effect of spatial intelligence, logical-mathematical intelligence, and emotional intelligence on students' mathematics learning achievement, both partialy and simultaneosly. (2) Spatial intelligence contributes 24.1% to students' mathematics learning achievement. (3) Logical-mathematical intelligence contributes 39% to students' mathematics learning achievement. (4) Emotional intelligence contributes 10.2% to students' mathematics learning achievement. (5) Collectively, spatial intelligence, logical-mathematical intelligence, and emotional intelligence contribute 73.3% to students' mathematics learning achievement and the remaining 26,7% is effected by factors beyond the scope of this study.* [THE EFFECT OF SPATIAL, LOGICAL ATHEMATICAL AND EMOTIONAL INTELLIGENCE ON STUDENTS' MATHEMATICS LEARNING ACHIEVEMENT] ***(Jurnal Fibonaci, 05(2): 16 - 25, 2024)***

Keywords: Spatial Intelligence, Logical Mathematical Intelligence, Emotional Intelligence, Multiple Intelligence Mathematics Learning Achievement

Introduction

A person's ability to reach their full potential, become competitive and qualified, and get ready to engage actively and positively in society are all shaped by their education. Indonesia urgently needs the best contributions from its citizens in this age of globalization. This is possible if everyone in society is given the chance to receive an education that enables them to maximize the development of their intellect and abilities. Mathematics is one subject taught in schools that helps advance science and technology (Artikasari & Saefudin, 2017). Additionally, mathematics is a universal discipline that promotes human thought, is essential to many other sciences, and is the foundation for the advancement of modern technology. Students learn mathematics in order to develop their capacity for logical, rational, critical, methodical, creative, and cautious thought (Suwardi et al., 2016).

Student achievement is effected by a variety of factors, both internal and external. Intelligence is one of the internal variables that affects how well students perform in school. One of the key psychological components in attaining learning success is intelligence. Maturity and growth factors, intelligence, motivating training, and personal factors are all considered internal elements. According to Purwanto in (Wirantasa, 2017), external influences include things like family and home situations, teachers and how they educate, facilities and teaching and learning, possibilities and circumstances nearby, and social environment and factors. Howard Gardner, a psychologist and Harvard University education professor, began studying different forms of intelligence in the early 1970s and developed the theory of multiple intelligences in 1983, applying it to the field of education. Nine different types of multiple intelligences are identified by gardner in his book Frames of Mind. These encompass spatial intelligence, mathematical-logical intelligence, linguistic intelligence, musical intelligence, bodily-kinesthetic intelligence, self-awareness intelligence, social intelligence, naturalist

intelligence, and existential intelligence (Gardner, 2011).

However, based on my observations made during the roughly three months that the mentoring activities took place between October 10 until December 12, 2023, as well as the outcomes of my interviews with the math teachers at MAN 1 Medan, there are three issues with students' mathematical learning. The first issue is that a lot of students still struggle with math classes, particularly when it comes to solving problems that require thinking through visualizations and pictures. The inability of students to solve math problems is the second issue. The third issue is that students still struggle to get over their fear and annoyance when they encounter challenging material and fail in. From the three problems demonstrate the importance of spatial intelligence for students. in the second, students' mathematical logical intelligence is still not functioning at its best, which results in their lack of proficiency in solving math problems; in the third, it is evident that emotional intelligence is needed for students to be able to control emotions and recognize other people's emotions well, so that they have high motivation and enthusiasm for learning and have good cooperation in the learning process. high and have good cooperation in the learning process. all three problems demonstrate the importance of spatial intelligence for students.

Based on the problems and explanations above, the authors are interested in conducting research on the effect of spatial, logical mathematical, and emotional intelligence on students' mathematics learning achievement. This study aims to determine the effect and contribution of these areas of spatial, logical mathematical, and emotional intelligence on students' mathematics learning achievement.

Literature Review

Mathematics Learning

According to Wijoyo (2021), The process of learning is the relationship in between teachers as educators and students as learners in the learning process is largely determined by the educator's personality in teaching and students in learning. According to Gusteti (2022), mathematics learning is a process of interaction between learning components to develop students' thinking skills in problem solving. Mathematics learning can help students construct mathematical concepts through their own abilities. n learning mathematics, educators must strive to develop students' mathematical thinking skills, especially logical thinking skills, in such a way that allows them to be actively involved in learning. Mathematics learning takes place when educators pay attention to the characteristics of mathematics, which are abstract, logical, and deductive.

Multiple Intelligence

Howard Gardner is the first originator of the theory of multiple intelligences. Gardner discovered the theory of multiple intelligences. Multiple intelligences is a term used by Howard Gardner to show that humans basically have many intelligences. Gardner published his findings in a book entitled Frames of Mind: The Theory of Multiple Intelligences (1983). Munif said Howard Gardner presented and marketed the findings of his many intelligences research. His theory eliminates the assumptions that have existed so far about human intelligence. His research's findings demonstrate that no aspect of human endeavor employs a single form of intelligence. The most dominant intelligence will control the other intelligences in addressing difficulties (Indria, 2020). Nine different types of multiple intelligences are identified by gardner in his book Frames of Mind. These include spatial intelligence, logical mathematical intelligence, verbal linguistic intelligence, musical intelligence, kinesthetic intelligence, intrapersonal intelligence, interpersonal intelligence, naturalist intelligence, and existential intelligence (Gardner, 1983).

Spatial Intelligence

Spatial means something related to space or place. Spatial intelligence is the ability to visualize images in the shadows or create two or three dimensional images. This intelligence is shown by an understanding of color, line, shape, space, size, and the relationship between elements, as well as the ability to see objects from various points of view (Katni, 2015). Maier (Yahya et al, 2014) defines the indicators of spatial intelligence as follows: (1) spasial perception, is the ability to observe a building of space or parts of space placed horizontally or vertically, (2) spatial visualization, as the capacity to imagine an image of a building in space whose parts are changing or moving, (3) mental rotation, includes the ability of rotate and reflect a building space accurately, (4) spatial relations, the ability for understanding the spatial form and the relationship between one part and another, (5) spatial orientation, ability to Students can determine the shape of a building space when viewed from several angles.

Spatial intelligence is required in mathematical learning; this intelligence enables students to have the ability to understand, visualize, and manipulate objects in space, which helps them understand mathematics concepts better. Students who have a high potential for spatial intelligence show more ability compared to other students in terms of, for example creating the imagination of forms in their thinking or the ability

to create two or three dimensional shapes (Purwa in Putri 2024).

Logical Mathematical Intelligence

According to (Muhaemin & Yonsen Fitrianto 2022), logical mathematical intelligence is a person's ability to use precise and accurate reasoning and process numbers correctly. The ability to calculate and use logic correctly facilitates understanding and analyzing a problem and solving it correctly. Meanwhile, Supardi in (Muhaemin and Yonsen Fitrianto, 2022) defines logical mathematical intelligence as a person's ability to think inductively and rationally, understand and analyze numerical examples, and use their thinking skills to solve problems appropriately. In contrast to Armstrong, Gadner states that there are 5 indicators of logical mathematical intelligence, namely: 1) mathematical calculations, means can perform mathematical calculation operations, 2) logical thinking, means can solve problems and represent information to the form of calculation operations, 3) problem solving, students are skilled at compiling problem-solving plans. 4) inductive and deductive estimation: Students are skilled at solving the problems given through the review of several examples given 5) Sharpness to patterns and relationship, sstudents are skilled at performing calculation operations through concrete objects and can connect abstract calculation patterns (Hamzah, in Hayati et al, 2023).

According to Nurdin & Yaumi in (Asmal, 2020) students who have high mathematical logic intelligence tend to enjoy the activity of analyzing and studying the causes and consequences of something that happens. Students also enjoy thinking conceptually, like formulating hypotheses, holding categorizations, and classifying what they face. They also tend to enjoy calculating activities and tend to quickly solve math problems. If students find it difficult to understand something, they tend to try to ask and find answers, and customary students who have this intelligence usually have a hobby of experimenting, asking answers, solving logical puzzles, and counting.

Emotional Intelligence

Shapiro in (Muis & Santosa, 2022) describes emotional intelligence as a collection of mental processes that include the capacity to keep an eye on the degree of emotions or feelings in both oneself and other people. Individuals with high emotional intelligence have self-confidence, are enthusiastic, manage everything, and use information to guide their thoughts and actions. On the other hand, Muslich in (Indrus et al, 2020) argues that self-control is a component of emotional intelligence. Put differently, emotional intelligence refers to an individual's capacity to express appropriate emotions in dealing with various situations.

According to (Goleman 2006), there are five other indicators of emotional intelligence: 1) knowing one's emotions, which means the ability to recognize self feelings, 2) managing emotions, which means having the capacity to handle emotions properly, 3) motivating oneself, that is having the perseverance to refrain from satisfaction, 4) recognizing emotions in others, that is the ability to recognize or care for others emotions (empathy), and 5) Handling relationships, which mean the ability to build relationships and communicate with others. Goleman (2006) proved that the human emotional level is more capable of showing a person's success. Intellectual intelligence cannot develop. If a person is born with a moderate state of intellectual intelligence, then his intelligence can never increase or decrease.

Methodology Research

Location and Times Research

The research conducted at Madrasah Aliyah Negeri 1 Medan, which is located at Jl. Williem Iskandar, Sidorejo Hilir, Medan Tembung district, Medan City, North Sumatra province. This research carried out during the odd semester 2023/2024 academic year.

Type of Research

This research adopts an *ex post facto* design with a quantitative approach.

Subject of Research

The subjects in this study were students from grade IX at MAN 1 Medan during the even semester of the 2023/2024 academic year. Two classes taken randomly from the 8 classes, specifically the XI-5 and XI-7 class, which consisted of 70 students.

Research Design

This study was designed as a dual paradigm with three independent variables and one dependent variable, as shown in the following figure.

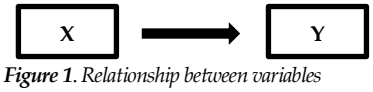


Figure 1*. Relationship between variables*

Research Procedures

Observations and interview were conducted to obtain several informations about students difficulties learning math in classroom. The observation sheet was used to collect data on

various aspects of the learning and the researcher will distribute the instrument and questionaires test to students to know their abiliy in spatial, logical mathematical and emotional intelligence on mathematics learning achivement.

Data Analysisi Technique

Data analysis in this study employed both descriptive statistical techniques, which were used to summarize spatial, logical-mathematical, and emotional intelligence, as well as students' mathematics learning achievement. Inferential statistical techniques were also utilized to examine relationships and potential effects among the variables (Cahyanti et al., 2019) .

Table 1. Criteria for Classification of Test Instrument Scores

Score Interval	Category
$0 \leq x < 40$	Very low
$40 \leq x < 60$	Low
$60 \leq x < 75$	Medium
$75 \leq x < 90$	High
$90 \leq x \leq 100$	Very high

Table 2. Criteria for Classification of Test Questionnaire Scores

Score interval	Category
Lowest score $\leq x < \mu - 2{,}5(\sigma)$	Very low
$\mu - 2{,}5(\sigma) \leq x < \mu - 1{,}5(\sigma)$	Low
$\mu - 1{,}5(\sigma) \leq x < \mu - 0{,}5(\sigma)$	Medium
$\mu - 0{,}5(\sigma) \leq x < \mu + 0{,}5(\sigma)$	High
$\mu + 0{,}5(\sigma) \leq x \leq$ highest score	Very High

Descriptive:

μ : Mean $= \frac{lowest\ score + highest\ score}{2}$

σ :Standard Dev $= \frac{highest\ score - lowest\ score}{6}$

Furthermore, inferential statistical analysis included regression analysis to determine the extent to which the independent variables influence the dependent variable, using the equation below (Sugiyono, 2016):

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$$

Then, an F-test was conducted to assess the validity of the obtained equation, formulated as follows

$$F_{count} = \frac{R^2/k}{1 - R^2/(n-k-1)}$$

Following the F-test, a t-test was conducted to ascertain the significance of the independent variable's effect on the dependent variable, using the following formula (Sugiyono, 2016):

$$t_{Count} = \frac{r\sqrt{n-k-1}}{\sqrt{1-r^2}}$$

Futhermore, the mathematics learning achievement score will get through the students mathematics final exam score in the even semester 2023/2024 academic year.

Research Result and Disscusion

Research Result

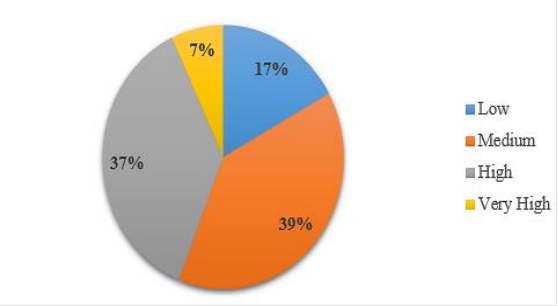
Descriptive Statistical Analysis

According to the descriptive statistical analysis of students' spatial intelligence, the scores ranged from a maximum of 90 to a minimum of 40, with an average score of 70 and a standard deviation of 11.8. Based on these average and standard deviation values, the categorization of students' spatial intelligence test results can be organized as presented in Table 3.

Table 3. Frequency and Percentage Distribution of Spatial Intelligence Score

Interval Score	Frequency	%	Category
$0 \leq x < 40$	0	0%	Very low
$40 \leq x < 60$	12	17%	Low
$60 \leq x < 75$	27	39%	Medium
$75 \leq x < 90$	26	37%	High
$90 \leq x \leq 100$	5	7%	Very High
Total	70	100%	

Figure 2. Frequency Diagram of Spatial Intelligence

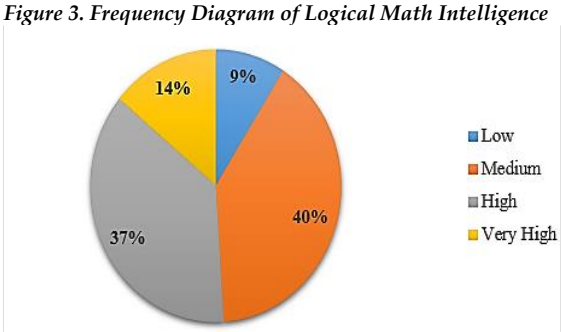


Moreover, based on the results of descriptive statistical analysis for students' logical-mathematical intelligence, the scores ranged from a maximum of 100 to a minimum of 45, with an average score of 74 and a standard deviation of 12.6. Using these average and standard deviation values, the categorization of students' logical-mathematical intelligence test results can be outlined in Table 4.

Table 4. Frequency and Percentage Distribution of Logical Mathematical Intelligence Score

Interval Score	Frequency	%	Category
$0 \leq x < 40$	0	0%	Very low
$40 \leq x < 60$	6	1%	Low
$60 \leq x < 75$	28	39%	Medium
$75 \leq x < 90$	26	43%	High
$90 \leq x \leq 100$	10	17%	Very High
Total	70	100%	

Figure 3. Frequency Diagram of Logical Math Intelligence



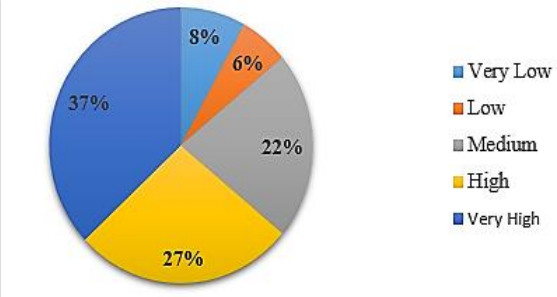
Subsequently, the descriptive statistical analysis for students' emotional intelligence revealed a maximum score of 96 and a minimum score of 58, with an average score of 76 and a standard deviation of 12.6.

Using these average and standard deviation values, the categorization of students' emotional intelligence test results can be depicted in Table 5.

Table 5. Frequency and Percentage Distribution of Emotional Intelligence Score

Interval Score	Frequency	%	Category
$58 \leq x < 62$	6	8%	Very low
$62 \leq x < 68$	4	6%	Low
$68 \leq x < 74$	15	22%	Medium
$74 \leq x < 80$	19	27%	High
$80 \leq x \leq 96$	26	37%	Very High
Total	70	100%	

Figure 4. Frequency Diagram of Emotional Intelligence



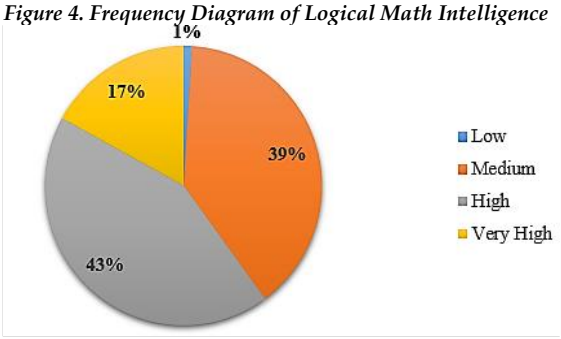
Futhermore, the descriptive statistical analysis for students' mathematics learning achievement revealed a maximum score of 96 and a minimum score of 55, with an average score of 76 and a standard deviation of 12.6.

Using these average and standard deviation values, the categorization of students' emotional intelligence test results can be depicted in Table 6.

Table 6. Frequency and Percentage Distribution of Math Learning Achievement Score

Interval Score	Frequency	%	Category
$0 \leq x < 40$	0	0%	Very low
$40 \leq x < 60$	1	1%	Low
$60 \leq x < 75$	27	39%	Medium
$75 \leq x < 90$	30	43%	High
$90 \leq x \leq 100$	12	17%	Very High
Total	70	100%	

Figure 4. Frequency Diagram of Logical Math Intelligence



Inferential Statistical Analysis

Before hypothesis testing, preliminary tests were conducted to ensure the validity of assumptions. These tests included checks for normality, linearity, multicollinearity, heteroscedasticity, and autocorrelation. The normality test specifically assessed whether the sample data originated from a normally distributed population. (Hamid et al., 2019). The normality test was conducted on the data for spatial, logical-mathematical and mhjjemotional intelligence and math learning achievement at a significance level of 0.05, with the findings detailed in Table 6 below.

Table 6. Normality Test Results

		Unstandardized Residual
N		70
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	5.64389666
Most Extreme Differences	Absolute	.065
	Positive	.065
	Negative	-.038
Test Statistic		.065

Asymp. Sig. (2-tailed)	.200[c,d]

The decision making criteria is if the Deviation from linearity is greater than 5% or 0,05 then the data is linear. It can be seen in table 7 below.

From the results of the normality test above, the significance value is 0.200. This means it is greater than 5% or > 0.05 so it can be concluded that the data is normally distributed.

Furthermore, a linearity test is carried out which aims to determine whether the form/model of regression X on Y is linear or not.

Table 7. Linearity Test Results

Independent Variable	F	Deviation From Linearity
Spatial Intelligence	1,019	0,436
Logical Mathematical Inteligence	1,892	0,065
Emotional Intelligence	0,860	0,651

Based on Table 4.10, it can be seen that the Deviation from Linearity value of each dependent variable relationship namely spatial intelligence, logical mathematical, emotional and the independent variable namely mathematics learning achievement is 0.436, 0.065 and 0.651, respectively, greater > 0.05, so it can be concluded that the variable relationship is linear.

The multicollinearity test is used to determine whether or not the study's independent variables have a substantial correlation with one another (Yamin & Kurniawan, 2009). With the provisions of the VIF (*Variance Inflatori Facto)* value < 10 on each independent variable, it means that it is free from multicollinearity symptoms. The multicollinearity test results can be seen in Table 8 below.

Table 8. Multicolinaerity Test Results

Variable Independent	Sig.	Tolerance	VIF
Spatial Intelligence	0,004	0,366	2,730
Logical Mathematical Intelligence	0,000	0,371	2,697
Emotional Intelligence	0,027	0,691	1,448

Based on the table above, the spatial intelligence variable has a *VIF* value of 2.730, then the mathematical logical variable of 2.697, and the emotional intelligence variable of 1.448, so it can be seen that the *VIF* value of each independent variable < 10, which means that the independent variables are free from multicollinearity symptoms.

Furthermore, the heteroscedasticity test is used to determine whether variances between the residual value in one observation period and another observation period occur from one observation period to the next (Sarwono, 2013) . The Glejser test was used in this study's heteroscedasticity test. Provided that if significance greater 5% or > 0.05 then there is no heteroscedasticity problem. The heteroscedasticity test results are displayed in Table 11 below.

Table 9. Heteroscedasticity Test Results

Variable Independent	Sig.
Spatial Intelligence	0,004
Logical Mathematical Intelligence	0,000
Emotional Intelligence	0,027

Based on the table above, the spatial inteligence variable has a significance value of 0,138, then the logical mathematical intelligence variable is 0,916 and the emotional intelligence variable is 0,856, so it can be seen that the significance value of each variable independent is greater than 5% or > 0,05, which means that the independent variables are free from symptoms of heteroscedasticity.

Once the data is linear, normally distributed, and linearly patterned with no problems with heteroscedasticity or multicollinearity, move on to evaluating the data hypothesis using multiple linear regression analysis, as shown in table 12 below.

Table 10. Results of Multiple Regression Analysis

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std Error	Beta		
1 (Constant)	12.006	5.912		2,031	0,046
Spatial Intelligence	0,287	0,097	0,311	2,956	0,004
Logical Mathematical	0,414	0,090	0,479	4,588	0,000

Intelligence					
Emotional Intelligence	0,203	0,090	0,173	2,256	0,027

Based on the table, the multiple linear regression equation can be described as follows:

$$Y = 12{,}006 + 0{,}287X_1 + 0{,}414X_2 + 0{,}203X_3$$

The regression equation above shows that the constant value is 12.006. This shows that if spatial intelligence (X_1), mathematical logical intelligence (X_2) and emotional intelligence (X_3) are zero or constant, then mathematics learning achievement (Y) has a value of 12,006. Spatial intelligence (X_1) provides a regression coefficient value of 0.287. This shows that if the spatial intelligence variable (X_1) increases by 1 unit, then mathematics learning achievement (Y) increases by 0.287 assuming that the variables of logical mathematical intelligence (X_2) and emotional intelligence (X_3) are considered zero or constant.

Logical Mathematical intelligence (X_2) provides a regression coefficient value of 0.414. This shows that if the logical mathematical intelligence variable (X_2) increases by 1 unit, then mathematics learning achievement (Y) increases by 0.414 assuming that the spatial intelligence variable (X_1) and emotional intelligence (X_3) are considered zero or constant. Emotional intelligence (X_3) provides a regression coefficient value of 0.203. This shows that if the emotional intelligence variable (X_3) increases by 1 unit, then mathematics learning achievement (Y) increases by 0.203 assuming that the spatial intelligence variable (X_1) and emotional intelligence (X_3) are considered zero or constant.

The coefficient value of the three independent variables including spatial intelligence, mathematical logical intelligence and emotional intelligence shows a positive sign, which means that there is a unidirectional influence between the spatial, mathematical logical and emotional intelligence variables on the mathematics learning achievement variable. this shows that the higher the value of spatial, mathematical logical and emotional intelligence, the higher the mathematics learning achievement will be, and vice versa.

Based on table 4.12 shows that the significance value for the spatial, logical mathematical and emotional intelligence is 0,004, 0,000 and 0,027 respectively so that lower than 5% or 0,05. then H_0 is rejected and Hypothesis is accepted, which means that the spatial, logical mathematical and emotional intelligence variable has an effect on mathematics learning achievement partialy.

While to find out whether or not there is an effect of spatial, logical mathematical and emotional intelligence on mathematics learning achievement together can be seen in table 13 below.

Table 11. F-Test Result

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6026.975	3	2008.992	60.327	000[b]
	Residual	2197.896	66	33.301		
	Total	8224.871	69			

Through this table, it is evident that intelligence's significance value of the variable spatial (X_1), variable mathematical logical (X_2) and variable emotional (X_3) together is 0.000 < 0.05, then H_0 is rejected and hypothesis is accepted, that means that spatial intelligence, mathematical logical intelligence and emotional intelligence simultaneously affect mathematics learning achievement.

Effective contribution (EC) to know how much contribution each independent variable namely spatial, logical mathematical and emotional intelligence on dependent variable namely mathematics learning achivement. Data to calculate the of effective contribution (EC) is obtained from the result of multiple linear regression analysis. The EC calculation is presented in the table 12.

Table 12. Effective Contribution

Variable	Coefficient of Regressi	Coefficient of Correlation	R Square	EC (%)

	on (BETA)			
Spatial Intelligence	0,311	0,778		23,3 %
Logical Mathematical Intelligence	0,479	0,813	0,733	40%
Emotional Intelligence	0,173	0,587		10%

Table 12 shows that the amount of effective contribution (EC) of spatial intelligence variable has a effect of 24,1% on mathematics learning achievement, then logical mathematical intelligence has a effect of 39% on mathematics learning achievement and emotional intelligence has a effect of 10,2%. So, it is possible to conclude that logical mathematical intelligence provides a more dominant effect on mathematics learning achievement of students in grade XI MAN 1 Medan.

Discussion

The findings of this study indicate a significant effect of spatial intelligence on students' mathematics learning achievement in Grade XI at MAN 1 Medan, contributing to 24.1%. This aligns with the research conducted by (Inuhan & Rupilele, 2022) titled "The Effect of Spatial Ability on Mathematics Learning Outcomes of Students SMA Negeri 8," which reported a regression coefficient of 0.547 and a significant effect (Sig. value of 0.00 < 0.05), contributing 32.2% to mathematics learning achievement.

Similarly, mathematical logical intelligence also shows a significant and positive effect on mathematics learning achievement among Grade XI students at MAN 1 Medan, contributing 39%. This finding corroborates (Rahman, 2019) entitled The Effect of Learning Interest and Student Mathematical Logic Intelligence research on "The Effect of Learning Interest and Student Mathematical Logic Intelligence on the Mathematics Learning Achievement of Class X Students of SMK in Jakarta Selatan," which found a regression coefficient of 0.532, a significant effect (Sig. value of 0.00 < 0.05), and a contribution of 71.2%.

Additionally, emotional intelligence has been found to significantly impact mathematics learning achievement among Grade XI students at MAN 1 Medan, contributing 10.2%. This supports (Leoh et al., 2019) study on "The Effect of Emotional Intelligence on the Mathematics Learning Achievement of VIII Grade Students of SMP Negeri 2 Kupang," which reported a regression coefficient of 0.417, a significant effect (Sig. value of 0.00 < 0.05), and a contribution of 48.6%.

Overall, this study provides evidence that spatial, logical-mathematical, and emotional intelligence collectively affect students' mathematics learning achievement, with these variables contributing 73.3%. The remaining 26.7% is influenced by other factors, as indicated by the Sig. values below 5% in the analyses conducted

CLOSING

Based on the results of the research and discussion, the following conclusions are obtained:

1. Spatial intelligence significantly positively affects the mathematics learning achievement of Grade XI students at MAN 1 Medan, contributing 24.1% to their overall achievement.
2. Logical mathematical intelligence also has a significant and positve effect on the mathematics learning achievement of of Grade XI students at MAN 1 Medan, contributing 39% to their overall achievement.
3. Emotional intelligence has a significant and positve effect on the mathematics learning achievement of of Grade XI students at MAN 1 Medan, contributing 10,2% to their overall achievement.
4. Collectively, Spatial intelligence, Logical mathematical intelligence, Emotional intelligence contribute significantly and positive effect on mathematics learning achievement of grade XI students at MAN 1 Medan, contributing 73,3% to their

overall achievement and the remaining is effected by other factors.

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