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The Effect of Teacher's Motivation and Communication Style on Increasing Students' Interest in Learning Mathematics

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ABSTRACT

This research investigates the impact of teacher motivation and communication style on students' interest in learning Mathematics. The background of the study highlights the critical role of these factors in enhancing student engagement and academic performance. The aim is to analyze the specific effects of teacher motivation and communication style on the learning interests of students. Utilizing a quantitative research method, data were gathered from 91 students through a questionnaire based on a 5-point Likert scale. The analysis employed multiple linear regression tests to assess the relationships. The results indicated that both teacher motivation and communication style significantly influence students' interest in Mathematics, both individually and collectively. The conclusion drawn from the study suggests that teachers should consistently provide motivation and maintain an effective communication style in the classroom to foster higher student interest in learning. Specifically, demonstrating openness in communication can create a comfortable learning environment, thereby enhancing students' engagement and interest in Mathematics. This research contributes to the education field by providing empirical evidence on the importance of teacher-student interactions in promoting academic interest and performance.

Keywords: Motivation, Communication Style, Learning Interset



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INTRODUCTION

At the beginning of 2020, history records that there has been the COVID-19 pandemic changed the order in the world of education not only having an impact in Indonesia but globally, all countries flocked to implement the learning that was considered effective in reducing the spread of the Covid19 virus. Indonesia is no exception, which carries out online or distance learning following government regulations with the existence of PSBB regulations (Large-Scale Social Restrictions). Students have to adapt and adjust to learning that is carried out online, this has changed drastically when previously learning was generally carried out face-to-face but had to change through virtual spaces that depend heavily on internet networks or cellular data. The need for internet or WiFi network availability becomes an obstacle when distance learning is implemented. The transition to online education during the coronavirus disease 2019 (COVID-19) pandemic may bring about adverse educational changes and adverse health consequences for children and young adult learners in grade school,

middle school, high schools, colleges, and professional schools (Hoofman and Secord, 2021). Schools including teachers and also parents have a role during COVID-19 so that the learning process is well established (Darmawan, 2021).

During the transition period, many students' interest in learning decreased and many teachers faced challenges in distance learning (Schult, 2022). A teacher can have various important roles in increasing student learning interest during the COVID-19 pandemic, the teacher could be the educator, motivator, and communicator (Lie and Triposa, 2021). Mathematics lessons have advantages and disadvantages that students can feel. The advantages of online mathematics learning are that students can look for additional mathematics learning resources through internet facilities, can access mathematics learning that is not limited in distance and time, learning is more flexible because it can be done anywhere while the disadvantages of online mathematics learning are such as not all students have unstable gadgets, signals or internet connections in certain areas, and students have difficulty understanding mathematical material that requires direct visualization (Basa and Hudaidah, 2021).

Mathematics is a compulsory subject at all levels of education starting from elementary, junior high, and high school as stipulated in Permendikbud Number 70 of 2013. Mathematics is taught by teachers in schools and is considered to play a careful, rational, critical, effective, and efficient role. Mastery of mathematics material students becomes an obligation in structuring reasoning and decision-making in the increasingly competitive era of competition at this time (Siagian, 2016). Mathematics learning is expected to be maximally prepared by using various kinds of learning models because mathematics learning places more emphasis on student involvement to be active in the learning process. Mathematics learning that does not or does not involve students being active will cause students not to be able to use their numeracy skills to the fullest in solving math problems. The ability and active participation of students is limited by the presence of online learning in the era of COVID-19 makes the teaching process experience obstacles in explaining material that cannot be explained directly so that student's interest in learning decreases. Marpa (2020) stated that the role of the mathematics teacher is essential in the involvement of the learning process and the use of technology during COVID-19. Innovation in learning must be carried out by teachers using technology, one of which is the use of Zoom in the learning process (Prasetyo, 2022).

Mathematics lessons are a challenge for most people that can be felt by the students themselves, teachers, and parents. Single and Lortie-Forgues (2017) found that children and adults still experience problems with fractions and decimal arithmetic which are important things to learn in math and science lessons. The importance of learning mathematics is inseparable from its role in various aspects of life, studying mathematics will hone a person's ability to think systematically, and scientifically and also think critically and increase creativity. In addition, mathematics lessons can hone students' logical intelligence. Students' mathematical abilities are a big challenge that must be faced by schools and also parents who have an important role to be able to develop these students' abilities. It is hoped that even though the pandemic will not have an impact on students' learning interest in learning mathematics, this will feel different because the conditions and readiness of schools and students are not sufficient enough to carry out online, such as facilities and infrastructure that are not yet supported, learning tools and learning techniques that are not yet available. not yet supportive, as well as the readiness of teachers and students to start getting used to learning in virtual spaces is a new polemic as well as a challenge that must be resolved. Students are expected to continue to have a high desire to learn in limited study space in the pandemic era and must also continue to improve especially in learning mathematics which requires students to be able to think critically, memorize various formulas, and count.

The role of the teacher in motivating students in the classroom is a must that must be carried out by the teacher towards students. Motivating to learn at this time is very necessary as a support to be able to increase student interest in learning not only in learning mathematics or other subjects that are academic but can be non-academic. Direct or face-to-face teacher motivation will have a direct impact on increasing student interest in learning, especially since the last two teachers and students experienced limitations with online learning carried out during the COVID-19 pandemic. Sari et. al. (2021) mentioned the importance of teachers being able to motivate their students, among others, to foster interest in learning, and from this sense of desire or willingness to learn students will be able to achieve the desired achievements, teachers can motivate students by motivating from within or intrinsically and motivation external or extrinsic. This intrinsic motivation comes from the students themselves to learn. Intrinsic motivation can be influenced by the student's desire to achieve a certain goal such as achieving, entering a favorite school, or making his parents proud while extrinsic motivation can be in the form of advice or advice from teachers to students, can also form of gifts from parents when students excel.

In addition to teacher motivation, there is one important factor that can increase student interest in learning, namely the existence of effective communication established between teachers and students in the classroom. The teacher's communication style can determine the delivery of learning and student understanding in the classroom. Sucia (2016) mentions that many students' failures to digest information from their teachers are caused by a mismatch in the teacher's communication style. In essence, the teaching and learning process is a communication process that exists between teachers and students in which there is a process of delivering messages from the source of the message (Teacher) through certain channels or media to the recipient of the message (Students). This can be seen in how the role of the teacher can communicate and interact with students in the classroom, create a comfortable atmosphere for learning, and convey messages or material that can be channeled properly to students.

The role of the teacher will describe how the pattern of behavior is expected in his interactions with students. Prey Katz explained the role of the teacher in that the teacher can act as a communicator, as a friend who can provide advice, as a motivator, as an inspiration and encouragement, and as a guide in developing attitudes and behavior (Pontoh, 2013). In the communication process, the teacher has an important role to be able to creating effective learning and increasing interest in learning, as in Putri and Muhammad's research (2019) which shows an increase in students' interest in learning through the teacher's communication style. Some previous studies have examined the effect of teacher motivation on increasing student learning interest such as research from Saputra and Rina (2022); and Tampubolon (2019). Overall, this research shows a positive effect of teacher motivation on increasing student learning interest, while other studies from Mufidah and Asmawi (2017); Fathurrohman (2018); Lasompo and Nadjamuddin (2020) and Wahyuningsih et. al. (2022) show that shows how important the teacher's role is in showing good communication so that there is an increase and interest in student learning.

Effective teachers generally can be able to communicate well to be able to stimulate students to accept learning in class. In post-Covid19 pandemic learning with the reimplementation of face-to-face learning (PTM), will teachers effectively provide motivation and communication styles that can increase students' interest in learning, especially in learning mathematics? This can be a momentum when face-to-face learning teachers can have many opportunities to control the class and the learning process directly and feel more flexible than virtual space which is limited by virtual space. Based on the description above, the researcher wants to research "The Effect of Teacher's Motivation and Communication Style on Increasing Students' Interest in Learning Mathematics in SMAN 5 Bogor".

METHODS

Research Design

The approach used in this research is quantitative. Creswell (2014) states that the quantitative approach is the measurement of quantitative data and objective statistics through scientific calculations derived from a sample of people or residents who are asked to answer several questions about surveys to determine the frequency and presentation of their responses, whereas according to Sugiyono (2013) research data on quantitative approach in the form of numbers and analysis using statistics. The purpose of the study was to test the hypothesis by using statistical calculations. This test examined the effect of independent variables, namely the teahcer's motivation (X1), and the teacher's communication style (X2) on the dependent variable of student learning interest (Y). The framework of this research is as follows:



Fig. 1 Research Concept Framework

Sample and Research Instruments

The method used in this research is the survey method. According to Kriyantono (2016), a survey is a research method using a questionnaire as a data collection instrument and the type of research used in this study is a descriptive study which aims to make systematic, factual, and accurate descriptions of the facts and characteristics of the population or the object. The data collection will use a purposive sampling technique. The number of samples analyzed in this study was 91 respondents the questionnaires will be distributed to 91 Grade 10 students at SMAN 5 Bogor in the 2022/2023 academic year who have attended Mathematics lessons. The data were collected

Research Procedure and Data Analysis

In the research procedure, the data was distributed via the Google Form link to 91 respondents as the sample of this research. The instrument is a closed questionnaire that was given to respondents through questions or alternative answers that have been made by researchers. After distributing the questionnaires and the data collected then the researchers tested the validity and reliability of the data first before analyzing the data. The validity test and the reliability test were intended to be able to measure how valid and reliable the questionnaire statement items are. If all items are valid and reliable, then the research would analyze the data using a normality test to determine whether, in the regression model, the dependent variable and the independent variable were normally distributed; using a Multiple Linear Regression Test to determine whether or not there is an influence of two or more

independent variables (X) on the dependent variable (Y); and using hypothesis testing (T-test and F-test) to test whether the hypothesis in this study is accepted or not.

RESULTS AND DISCUSSION

Results

Validity and Reliability Test

In testing the validity of the questionnaires, the researcher distributed the questionnaires to 30 respondents. Then the results of the data were tested using the Pearson Product Moment validity test, then the data was processed using the help of SPSS software version 26 system type 64bit using the Windows 10 operating system. The amount of data (n) is 30, then the r table is 0.361. The criteria used to determine a valid questionnaire are:

1. If r count > r table, then the statement is declared valid.

2. If r count <r table, then the statement is declared invalid.

The result of the validity test is all items in the questionnaire statement were declared valid as the following table below:

No. of Items	R-Count	R-Table	Category
1	0,582	0,361	Valid
2	0,585	0,361	Valid
3	0,561	0,361	Valid
4	0,561	0,361	Valid
5	0,696	0,361	Valid
6	0,747	0,361	Valid
7	0,482	0,361	Valid
8	0,532	0,361	Valid
9	0,550	0,361	Valid
10	0,507	0,361	Valid
11	0,568	0,361	Valid
12	0,528	0,361	Valid
13	0,390	0,361	Valid
14	0,485	0,361	Valid
15	0,536	0,361	Valid
16	0,451	0,361	Valid
17	0,602	0,361	Valid
18	0,697	0,361	Valid
19	0,693	0,361	Valid
20	0,505	0,361	Valid
21	0,805	0,361	Valid
22	0,561	0,361	Valid
23	0,871	0,361	Valid
24	0,751	0,361	Valid
25	0,754	0,361	Valid
26	0,684	0,361	Valid
27	0,537	0,361	Valid
28	0,584	0,361	Valid
29	0,821	0,361	Valid
30	0,538	0,361	Valid

able 1. The Deculte of the Validity Test

In addition to validity testing, there is also reliability testing and the basis for decisionmaking in reliability testing is as follows:

a. If the coefficient of Cronbach's alpha \geq 0.60 then Cronbach's alpha is acceptable (construct reliable).

b. If Cronbach's Alpha < 0.60 then Cronbach's Alpha is poorly acceptable (construct unreliable).

The results of the reliability test showed that all variables were reliable with the results of the reliability test for variable X1 Teacher's Motivation obtaining a Cronbach's Alpha value of 0.767, variable X2 Teacher's Communication Style obtained a Cronbach's Alpha value of 0.659, and variable Y Student Learning Interest obtained a Cronbach's Alpha value of 0.882. Thus it can be concluded that the research instruments that the researchers distributed to 30 respondents to be used in this study were declared reliable, with a coefficient value of > 0.60.

Normality test

The normality test aims to be able to test whether, in the regression model, the dependent variable and independent variable have a normal distribution or not. The normality test used in this study, namely using the Kolmogorov-Smirnov Test (KS Test) looks at the significant probability number where the data can be concluded to be normally distributed if the significance number is > 0.05.

One-Sa	mple Kolmogorov-Smirnov Test	
		Unstandardized
		Residual
Ν		91
Normal Parameters ^{a,b}	Mean	,000000
	Std. Deviation	4,71016485
Most Extreme Differences	Absolute	,070
	Positive	,043
	Negative	-,070
Test Statistic		,070
Asymp. Sig. (2-tailed)		,200 ^{c,d}
a. Test distribution is Normal.		
b. Calculated from data.		
c. Lilliefors Significance Correction.		
d. This is a lower bound of the true s	ignificance.	

Table 2. Kolmogorov Smirnov Normality Test Result One-Sample Kolmogorov-Smirnov Test

Based on the table above, it can be seen that the significance value of Asymp. is 0.200. According to Kolmogorov Smirnov, if the significance value is > 0.05, the regression model meets the normality assumption. Therefore, it can be concluded that based on the Kolmogorov-Smirnov test, the data is normally distributed because the significance value is 0.200 > 0.05.

Multiple Linear Regression Test

Multiple linear regression analysis is a linear relationship between two or more independent variables (X1, X2,....Xn) and the dependent variable (Y). Below are the results of multiple linear analyses in this study:

		TUDIE 3	. Multiple Linet	ii negression res	i l	
			Coefficients ^a			
Model		Unstandardized Coefficients		Standardized	t	Sig.
				Coefficients		
		В	Std. Error	Beta		
1	(Constant	-4,772	5,227		-,913	,364

Table 3. Multiple Linear Regression Test

)					
	Total_X1	,615	,115	,476	5,343	,000
	Total_X2	,416	,120	,309	3,470	,001
a. Dep	endent Variabl	e: Total_Y				

Below is a linear equation intended to get the value of the dependent variable:

Y = a + b1X1+ b2X2+....+ bnXn Y = -4,772 + 0,615 X1 + 0,416 X2

Based on these equations, it can be described that the constant (a) is -4.772, meaning that if all the independent variables (teacher's motivation and teacher's communication style) are considered constant or do not change, then student learning interest will decrease. The constant value of -4772 results from multiple linear regression means a negative effect where there is no increase in students' interest in learning mathematics if there is no change in the teacher's motivation and communication style.

The regression coefficient b1 on X1 Teacher Motivation is worth 0.615. Stating that every additional 1% of the value of Teacher Motivation, will increase the value of increasing student interest in learning by 0.615. This value indicates that the variable X1 Teacher Motivation has a positive relationship to the variable Y (Student Learning Interest) or the higher the Teacher Motivation in the class, the stronger the increase in interest in learning mathematics at SMAN 5 Bogor.

The regression coefficient b2 on X2 Teacher Communication Style is 0.416. Stating that every 1% addition of the Teacher Communication Style value, will increase the value of increasing student interest in learning by 0.416. This value indicates that the variable X2 Teacher Communication Style has a positive relationship to variable Y (Student Learning Interest) or the better the Teacher Communication Style, the stronger the increase in interest in learning mathematics at SMAN 5 Bogor.

Hypothesis Test

T-test (Partial Significance Test)

The hypothesis testing in this study was carried out by comparing the significance level (sig) of the research with a significance level of 0.05 or 5%. Tests are carried out using significant figures with the following conditions:

- If the research significance number is <0.05 then Ho is rejected Ha is accepted.
- If the research significance number is > 0.05 then Ho is accepted and Ha is rejected.

			Coefficients ^a			
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		В	Std. Error	Beta		
1	(Constant)	stant 5,055 4,658			1,085	,281
	Total_X1	,807	,107	,625	7,553	,000
a Den	 endent Variabl	e Total Y		· ·		

Table 4. T-Test Result Variable X1 to Variable Y

Based on the calculation on the table above, it show the sig. on the teacher's motivation variable of 0.000 > 0.005 thus the variabel X1 (teacher's motivation) partially influences variable Y (student learning interest), it can be described as below:

Ha1: There is an influence of teacher's motivation on increasing student interest in learning mathematics at SMAN 5 Bogor.

			Coefficients ^a			
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		В	Std. Error	Beta		
1	(Constant)	8,367	5,278		1,585	,116
	Total_X2	,724	,120	,539	6,030	,000
	بالما ماتين مركز الممريم امرين					

Table 5. T-Test Result Variable X2 to Variable Y

a. Dependent Variable: Total_Y

Based on the table above, it show the sig. on the teacher's communication style variable of 0.000 > 0.005 thus the variable X2 (teacher's communication style) partially influences variable Y (student learning interest), it can be described as below:

Ha2: There is an influence of teacher's motivation on increasing student interest in learning mathematics at SMAN 5 Bogor.

F-test (Simultaneous Significance Test)

The F test (Simultaneous Significance Test) aims to determine the extent of the effect simultaneously or together. The criteria used for decision-making are as follows:

• If the significant value is > 0.05 then Ho is accepted and Ha is rejected, meaning that there is no effect of variable X simultaneously on variable Y.

• If the significant value < 0.05 then Ho is rejected and Ha is accepted, meaning that there is an effect of variable X simultaneously on variable Y.

			ANOVA ^a			
Model		Sum of	df	Mean	F	Sig.
		Squares		Square		
1	Regression	1728,280	2	864,140	38,085	,000 ^b
	Residual	1996,709	88	22,690		
	Total	3724,989	90			
a. Dep	oendent Variable	: Total_Y				
h Pre	dictors: (Constar	t) Total X2 Total	X1			

Table 6. F-Test Result

In the results of the F test table as in the table above it can be concluded that the significance value is 0.000 <0.05, then Ho3 is rejected and Ha3 is accepted therefore, it can be concluded that there is a simultaneous or joint effect between variable X1 (Teacher's Motivation) and variable X2 (Teacher's Communication Style) to variable Y (Students' Learning Interest), it can be described as below:

Ha3: There is an influence of teacher motivation and teacher communication style on increasing student learning interest in learning mathematics at SMA N. 5 Bogor.

Discussion

Influence of Teacher's Motivation on Students' Learning Interest

Based on the results of this study, teacher motivation affects increasing student learning interest in learning mathematics at SMAN 5 Bogor, and the respondents' answers to each statement of indicator X1, namely teacher motivation, state that teacher motivation partially has a positive and significant effect on increasing student learning interest in learning mathematics. The results of testing the hypothesis stated that the sig. on the teacher motivation variable 0.000 > 0.05 thus it can be concluded that Ho1 is rejected and Ha1 is accepted. This shows that variable X1, namely teacher motivation partially influences variable Y, namely there is an increase in students' learning interest in learning mathematics at SMAN 5 Bogor.

The SOR theory (Stimulus, Organism, Response) by McQuil (2010) believes that the causes of attitudes that can change depend on the quality of the stimuli that communicate with the organism. If it is related to this research, the teacher plays an important role as a communicator who can provide stimulation in the form of motivation to students who as organisms or recipients of messages from communicators, with the stimulation in the form of motivation from the teacher itself will be able to increase students' learning interest in learning mathematics.

Influence of Teacher's Communication Style on Students' Learning Interest

In the results of this study, the teacher's communication style affects increasing student learning interest in learning mathematics at SMAN 5 Bogor, and the respondents' answers to each statement of indicator X2, namely teacher communication style, state that the teacher's communication style partially has a positive and significant effect on increasing student learning interest in Mathematics learning. The results of testing the hypothesis stated that the sig. on the Teacher Communication Style variable 0.000 > 0.05 and t-count 6.030 < t-table 1.987 so that Ho1 is rejected and Ha1 is accepted. This shows that variable X2, namely the teacher's communication style partially influences variable Y, namely there is an increase in students' learning interest in learning mathematics at SMA Negeri 5 Bogor.

Stimulus in SOR theory has an important role so that it can cause a response (response) from the organism, in this case, it means that the stimulus is the teacher's communication style, the organism is the learner, and the response is a response or reaction from the stimulus given by the teacher. As in the results of this study, teachers who have an assertive communication style are more liked by students shown with the highest scores in the communication style category while teachers with an aggressive communication style are not liked by students. The importance of the teacher's communication style can directly influence students' learning interest in class, especially in learning Mathematics. With a more humanist approach and always listening to what are the obstacles or problems faced by students, students will like more so that they can increase their high interest in learning when compared to an approach with a communication style that tends to be aggressive in the classroom shown by the teacher so that it does not make students are interested in learning even if there is no interest in learning at all.

Influence of Teacher's Motivation and Teacher's Communication Style on Students' Learning Interest

In the results of this study, teacher motivation and teacher communication style influence the increase in student learning interest in learning mathematics at SMAN 5 Bogor. On the results of hypothesis testing, the F test states that the significance value is 0.000 < 0.05 and F-count > F-table = 38.085 > 3.95, then Ho3 is rejected and Ha3 is accepted, thus it can be concluded that there is an effect simultaneously or together between variable X1 (Teacher

Motivation) and variable X2 (Communication Style) to variable Y (Student Learning Interest) of 38.085.

Overall, in line with the SOR Theory (Stimulus, Organism, Response) which explains the process of changing behavior is essentially the same as the learning process, as described by MCQuail (2010) which says the process of stimulus (stimulus) given by the teacher is in the form of (Motivation and Teacher Communication Style) can be accepted or rejected with an increase in students' interest in learning Mathematics as in this study found that there was an increase in the response in the form of student learning interest due to the presence of Motivation and Teacher Communication Style which proves that the stimulus can be accepted by students with the motivation and good communication style used by the teacher.

CONCLUSION

Increasing student learning interest in learning mathematics is due to the teacher's motivation and communication style. This is to the theory of SOR (Stimulus, Organism, Response) that the stimulus process (stimulus) can affect changes in the behavior of the organism which can cause a response to a given stimulus. This study shows that there is a teacher's motivation and communication style that functions as a stimulus that has a positive value towards increasing responses by showing an increase in learning interest in learning mathematics by students who act as organisms.

The recommendation is for teachers to be able to always motivate the class students so that they can increase a high interest in learning in the classroom, especially in learning mathematics. In addition, the teacher must be able to show a good communication style and an open attitude so that they can understand how problems are faced by students in the classroom. A communication style that is open and does not tend to be aggressive, will make students comfortable learning in the classroom and can increase their interest in learning.

It is also for the students to be able to increase their interest in learning and self-discipline to improve their learning achievement at school. Having a high interest in learning will encourage students to be more active in learning and be able to motivate themselves so they can get better grades. For future readers and researchers, this research can be useful for future researchers, it can be used as a guide in research related to teacher motivation, teacher communication styles, and student learning interests.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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