



The Influence of Teacher Technology Ability, Parental Support, Teacher Competence, Learning Environment, and Learning Interest on Learning Outcomes with The Moderating Variable of Learning Motivation

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Abstract: In digital era, motivation become the best variable to increase student learning outcome. This research aims to examine the influence of teachers' technological abilities, parental support, teacher competence, learning environment, interest in learning on learning outcomes with the moderating variable learning motivation of junior high school students in Riau province. The population in this study were all junior high school students in Pekanbaru were taken randomly using a simple random sampling technique, the number of samples taken was based on 9 schools using the Slovin formula, so that 270 students were obtained from the 9 schools. The data collection technique used was a survey and the instrument was a closed questionnaire. The data analysis used in this research is descriptive testing, mediation testing, and hypothesis testing. Based on the results of the t test in the table statistics, it can be seen that there is no influence of teacher technology abilities, teacher competence and interest in learning on learning outcomes. Parental support and the learning environment have a significant effect on learning outcomes. Learning motivation is only able to moderate the variables of teacher technology ability, parental support, teacher competence on learning outcomes.

Keywords: junior high school; learning motivation; learning outcomes

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INTRODUCTION

Student learning outcomes are the parameters used to measure educational success (Herwan et al., 2018). Learning outcomes will reflect the extent to which students have accepted and understood the information and knowledge taught in the educational environment. These learning outcomes include cognitive aspects, skills, and understanding of concepts students have attempted during the learning process (Strouse & Nickerson, 2016). However, low student learning outcomes are currently a problem that is still encountered in most schools in Indonesia (Özdemir, 2020), mainly suburban or remote schools. Educational problems can occur due to a lack of support from various aspects. Among them are the quality of teaching that is not yet optimal, lack of learning facilities, low technological capabilities of students, lack of teacher ability in managing learning classes, lack of parental support, and so on, which also have an impact on the low learning outcomes of students (Luque-Reca et al., 2022). Comprehensive efforts are needed to overcome these challenges and improve student learning outcomes. In improving learning outcomes, it is necessary to know the factors that influence student learning outcomes (Unruh et al., 2024).

Learning outcomes can be influenced by internal factors and external factors (Lin et al., 2017). Internal factors come from within students, such as hopes for ideals, desire and desire to succeed, and encouragement of learning needs (Seehawer & Breidlid, 2021). Meanwhile, external factors come from outside the student, such as a conducive learning environment, rewards, punishments, engaging learning activities, instruments (curriculum, learning methods, facilities, and teachers), and learning atmosphere. One effort to improve learning outcomes is through external factors, namely by improving the ability to manage and use technological elements needed to assist the learning process (Kurnianto & Haryani, 2019). Technological capabilities are important for every teacher to support students' needs in meeting the demands of the 21st century, where almost all aspects of life utilize digital technology. Teachers with technological skills will provide good teaching according to the times, so students will have greater opportunities to deepen their knowledge and develop relevant skills. Therefore, every teacher is required to master technology to support educational and learning activities in the classroom to innovate in material development (Kleij et al., 2015).

Using technology will be more focused when parents are actively involved in their children's education through guidance, motivation, or supervision (Holzberger et al., 2013). Students tend to have higher motivation and enthusiasm for learning when supported by the support of their parents (Irmayani et al., 2018). For

students, it is essential to have motivation to learn (Lee & Kuo, 2019). Apart from that, parental support can also create a positive learning environment at home, strengthening learning at school (Leal-Rodríguez & Morant, 2019). A pleasant environment for students at home and school can influence students' comfort and motivation in learning (Layek & Koodamara, 2024). Adequate facilities and a safe environment can support learning (Amelia & Wilhelmus, 2022). Apart from that, the social environment at school, such as relationships between students and interactions with peers, also plays a role in forming a positive learning climate (Parkerson & Parkerson, 2017).

Much research has been related to the environment, parental support, and the influence of digital skills. Jay and Knaus (2018) explain that there is a strong relationship between digital skills and student learning outcomes. Student learning outcomes will increase if website media in discovery learning and digital literacy skills are improved. It shows no influence in the digital literacy variable on learning achievement in economics subjects. However, different from these studies, this research aims to determine the extent to which digital literacy can influence student learning outcomes and whether learning motivation will strengthen or weaken the influence of digital literacy. So, the novelty of this research is the existence of a moderating variable, namely students' learning motivation. Learning motivation is one of the internal factors that can influence student learning outcomes. Motivation has long been identified as a key parameter for student success and achievement (Guastafarro et al., 2017). Motivation is a mental impulse that moves and directs human behavior, including learning activities. Motivation encourages a person to learn to achieve the desired goals (Panaoura, 2021). Students who have the desire and support within themselves to learn tend to be successful regarding learning outcomes because students will be moved and directed in their attitudes and behavior in learning with increased motivation (Donkoh et al., 2023).

Motivation to learn is an important factor for students, parents, and teachers (Li et al., 2021). For students, learning motivation can encourage enthusiasm for learning and direct their learning activities according to their needs. In contrast, for teachers and parents, by understanding and knowing the importance of students' learning motivation, it will be easy to generate and maintain students' enthusiasm for learning (George & Sabhapathy, 2014). In this way, students do not quickly feel bored and fed up with learning, so that they can succeed at school and home. The above phenomenon aroused the researcher's concern, so the researcher attempted to study various literature empirically and systematically related to the impact of parental support, teacher pedagogical competence, and learning motivation on student learning outcomes.

Among the factors of parental support, teacher pedagogical competence, and learning motivation that more dominantly influence student learning outcomes is the student's learning motivation (Ng & Kwan, 2020). Because learning motivation is the main factor determining students' learning success (Julianti & Hatiarsih, 2020), this is in line with Holzberger et al. (2013), Sidabutar (2020), Ottenbreit-Leftwich et al. (2018), and Ega et al. (2023) which measures the influence of learning motivation on learning outcomes. This research shows that learning motivation has a positive and significant influence on learning outcomes. Apart from motivation, this research also examines student interest as an internal factor influencing learning outcomes. Interest greatly influences students' learning activities (Admiraal & Røberg, 2023). An interest in learning in students will create curiosity and enjoyment from the material being taught and the way the teacher conveys the lesson material. If the learning material and the way the teacher conveys it does not match the students' interests, then the students will not learn well and optimally because there is no attraction for them (Clivaz et al., 2023; Falcon et al., 2023).

Lack of student interest in learning will result in students not getting satisfaction from the lesson. On the other hand, learning material that interests students is more straightforward to memorize and convey because interest increases learning activities. Each student's interest in learning in the learning process is different (Abdullah, 2018). Students with a high interest in learning will easily accept the lessons the teacher gives because they are motivated by high curiosity and have a strong enthusiasm so that everything they want can come true. Meanwhile, students with low interest in learning find it difficult to receive lessons because they tend not to want to know and do not pay attention to the material provided by the teacher, so their learning results are less than optimal (Imhangbe et al., 2020). According to Sobari (2017), the visible influence of these two aspects can be said to influence each other. According to the calculation results, students' interest in learning, which influences learning outcomes, is categorized as low at 36.8%, while other factors influence the remaining 63.2%.

This research presents a novel contribution by simultaneously examining the influence of both external and internal factors on learning outcomes (Y) through a comprehensive regression model involving seven key variables. Unlike previous studies that tend to focus on isolated variables, this study integrates Teacher Technology Capabilities (X_1), Parental Support (X_2), Teacher Competency (X_3), and Learning Environment (X_4) as external factors while also considering Interest to Learn (X_5) and Motivation to Learn (Z) as critical internal mediators. The inclusion of Motivation to Learn (Z) as a mediating variable adds significant novelty, as it bridges the relationship between interest and actual learning outcomes, providing deeper insights into the psychological

mechanisms that drive student performance. Additionally, the role of Teacher Technology Capabilities (X_1) highlights the relevance of digital competency in modern educational settings, an aspect that remains underexplored in holistic learning models. By analyzing these variables together, this study offers a more integrative understanding of how technological, environmental, parental, and psychological factors interact to influence student success. This multifaceted approach enriches the existing body of literature and provides actionable insights for educators, policymakers, and stakeholders in improving educational practices in the digital era.

Based on the results of pre-observations that have been carried out, it turns out that mathematics learning outcomes are still relatively low, as can be seen from the average Final Semester Assessment scores, with a value below the passing grade of 57%. This problem of low learning outcomes certainly needs to be addressed immediately, considering that learning mathematics is important for students. Apart from that, it is also known that students are less enthusiastic about learning. This condition can be seen from the low response of students to learning activities in class. When the teaching and learning process occurs, at least 7 students per class are still passively participating in learning activities. For example, some are still reluctant to answer when the teacher asks students questions regarding the material. Often, students who are less enthusiastic about participating in learning are busy talking to their classmates alone, so students ignore the material explained by the teacher. This shows that there are students whose learning motivation is not optimal. Based on the background that has been explained, it appears that students' digital literacy in influencing learning outcomes moderated by students' learning motivation is not consistent. Therefore, the author will re-examine this topic when applied to junior high school students. Thus, researchers are interested in researching the influence of technological abilities, parental support, teacher competence, learning environment, and learning interest on learning outcomes with the moderating variable learning motivation.

METHODS

The research method used in this research is quantitative, with the independent variables being teacher technology capabilities, parental support, teacher competence, learning environment, and interest in learning. The dependent variable in this research is learning outcomes. Then, there is a moderating variable, namely learning motivation, which is used as a moderating variable. The population in this research is students in the 2023/2024 academic year consisting of 9 junior high schools in Riau Province. The sample used in this research is a simple random sampling method, where sample members from the population are taken randomly without paying attention to the strata in the population (Sugiyono, 2017). Sampling uses Slovin's formula.

Table 1. Population and Sample

School	Population	Sample
Schools 1	600	37
Schools 2	418	36
Schools 3	100	28
Schools 4	128	30
Schools 5	148	31
Schools 6	79	26
Schools 7	88	27
Schools 8	99	28
Schools 9	80	27
Total		270

Data collection techniques in this research were through questionnaire and documentation techniques. The research instrument in this study will go through validity and reliability tests first. Data collection techniques in this research were conducted through questionnaires and documentation techniques. The questionnaire was designed to gather detailed participant responses, allowing researchers to obtain quantitative and qualitative data. This method helped understand participants' perspectives and provided standardized data for analysis. Meanwhile, the documentation technique involved reviewing existing records, reports, and relevant documents to support the data collected through questionnaires. Combining these two techniques ensured a comprehensive and reliable dataset, enhancing the overall validity of the research findings. Before the instrument was distributed to respondents, it underwent content validation by experts in the relevant field to ensure that each item aligned with the research objectives. This content validation process aimed to assess the items' clarity, relevance, and appropriateness in measuring the intended variables. After being reviewed by experts, the instrument was analyzed using Aiken's V to evaluate the validity level of each item based on expert assessments. The results of this analysis identified items with high validity and highlighted those that required revision or

elimination. Subsequently, the instrument's construct validity was examined using Confirmatory Factor Analysis (CFA) to verify that the hypothesized factor structure fit the empirical data. This CFA analysis helped confirm the relationships between latent variables and their measured indicators, resulting in a valid and reliable instrument.

Data analysis techniques in this research include descriptive statistical tests, classical assumption tests, multiple regression analysis, hypothesis testing, and Sobel tests. Descriptive statistical tests were conducted to summarize and describe the basic features of the data, such as mean, standard deviation, minimum, and maximum values, providing an overview of the dataset. Classical assumption tests, including normality, multicollinearity, heteroscedasticity, and autocorrelation tests, were applied to ensure the data met the necessary conditions for reliable regression analysis. After confirming the data's suitability, multiple regression analysis was employed to examine the relationship between independent and dependent variables, identifying the strength and direction of these relationships. Hypothesis testing was carried out using t-tests and F-tests to determine the statistical significance of the regression coefficients and the overall model fit. The Sobel test was conducted to analyze the mediating effect between variables further, which helped assess the significance of indirect effects within the proposed model. This comprehensive approach to data analysis ensured robust and valid results, supporting the research findings.

RESULT AND DISCUSSION

Descriptive statistical tests provide a general description or overview of data through the characteristics of the research variables as seen from the average value (mean), maximum value, minimum value, variance, and standard deviation (Ghozali, 2016).

Table 2. Descriptive Statistical Test

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
X1	270	24,00	45,00	34,2185	6,17529
X2	270	24,00	47,00	35,3407	6,82785
X3	270	46,00	64,00	55,5185	5,31513
X4	270	22,00	40,00	31,5630	5,30779
X5	270	35,00	64,00	52,6111	5,71054
Z	270	40,00	79,00	67,0815	6,78951
Y	270	60,00	100,00	81,9444	9,13675
Valid N	270				

Based on the results of descriptive tests, the distribution of data obtained by researchers can be described as follows. The teacher technology ability variable (X_1) has a minimum value of 24, a maximum value of 45, an average value of 34.21, and a standard deviation of 6.17. The parental support variable (X_2) has a minimum value of 24, a maximum value of 47, an average value of 35.34, and a standard deviation of 6.82. Teacher competency variables (X_3) have a minimum value of 46, a maximum value of 64, an average value of 55.51, and a standard deviation of 5.31. Learning environment variables (X_4) have a minimum value of 22, a maximum value of 40, an average value of 31.56, and a standard deviation of 5.30. The learning interest variable (X_5) has a minimum value of 35, a maximum value of 64, an average value of 52.61, and a standard deviation of 5.71. The learning motivation variable (Z) has a minimum value of 40, a maximum value of 79, an average value of 67.08, and a standard deviation of 6.78. Finally, the learning outcome variable (Y) has a minimum value of 60, a maximum value of 100, an average of 81.94, and a standard deviation of 9.13. The normality test functions to test whether or not the regression model used in the research is normally distributed in the form of dependent and independent variables (Ghozali, 2016). This test was based on the One-Sample Kolmogorov-Smirnov (K-S) statistical test decision.

Table 3. Normality Test Results

Variables	N	Kolmogorov-Smirnov	Asymp. Sig	Conclusion
Teacher Technology Capabilities (X_1)	270	1.293	0.071	Normal
Parental Support (X_2)	270	1.289	0.072	Normal
Teacher Competency (X_3)	270	1.328	0.059	Normal
Learning Environment (X_4)	270	1.323	0.060	Normal
Interest to learn (X_5)	270	1.065	0.207	Normal
Motivation to learn (Z)	270	0.943	0.337	Normal
Learning outcomes (Y)	270	0.633	0.818	Normal

The table presents the normality test results for several research variables, including teacher technology capabilities, parental support, teacher competency, learning environment, interest to learn, motivation to learn, and learning outcomes. The normality test was conducted using the Kolmogorov-Smirnov method with a sample size of 270 respondents. The Kolmogorov-Smirnov values for all variables range from 0.633 to 1.328, while the Asymp. Sig. values fall between 0.059 and 0.818. Since all variables have Asymp. Sig. values greater than 0.05, it can be concluded that the data follows a normal distribution. These results indicate that the data used in this research meets the normality assumption required for further statistical analysis. With the normality assumption fulfilled, the study can apply more robust and accurate parametric analysis methods. This is crucial to ensure that the research findings are valid and reliable. A normally distributed dataset also allows for better-interpreting relationships between the studied variables. If the data were not normally distributed, alternative methods such as non-parametric analysis might be necessary. Therefore, normality testing is a crucial initial step in the data analysis. In conclusion, all variables in this study meet the normality requirement, forming the basis for further statistical analysis. The multicollinearity test functions to test whether or not the regression model formed is found to have a correlation between the independent variables (Ghozali, 2016). This test is based on the Variance Inflation Factor (VIF) and Tolerance Value.

Table 4. Multicollinearity Test Results

		Coefficients^a	
	Model	Collinearity Statistics	
		Tolerance	VIF
1.	(Constant)		
	Teacher Technology Capabilities	.895	1.117
	Parental Support	.895	1.117
	Teacher Competency	.692	1.445
	Learning Environment	.743	1.346
	Interest to learn	.279	3.589
	Motivation to learn	.308	3.248

The data in Table 4 shows no correlation between independent variables or multicollinearity. The VIF value of the variable teacher technology ability (X_1) is 1.117, parental support (X_2) is 1.117, teacher competence (X_3) is 1.445, learning environment (X_4) is 1.346, interest in learning (X_5) is 3.589 and motivation to learn (Z) amounting to 3,248. Meanwhile, the tolerance value for the variable teacher technology ability (X_1) is 0.895, parental support (X_2) is 0.895, teacher competency (X_3) is 0.692, learning environment (X_4) is 0.743, interest in learning (X_5) is 0.279 and learning motivation (Z) of 0.308. So, it can be concluded that the model does not have multicollinearity problems because the Variance Inflation Factor (VIF) value is less than 10, and the tolerance is more significant than 0.01. Therefore, it can be interpreted that the data in this study is suitable for use as a reference for further tests because there are no symptoms of multicollinearity. The heteroscedasticity test functions to test whether there is unequal variation in the residual value of one observation to another in the regression model. A good regression model is one where heteroscedasticity does not occur (Ghozali, 2016). This test is carried out using the Glejser test.

Table 5. Heteroscedasticity Test Results

		Coefficients^a
	Model	Sig.
1	(Constant)	
	Teacher Technology Capabilities	.051
	Parental Support	.453
	Teachers' competency	.090
	Learning Environment	.991
	Learning Interest	.322
	Learning Motivation	.308

a. Dependent Variable: Learning results

Based on the data in the table above, the results of the heteroscedasticity test show that there are no symptoms of heteroscedasticity. The significant level of the variables is teacher technological ability (X_1), parental support (X_2), teacher competence (X_3), learning environment (X_4), learning interest (X_5) on learning outcomes (Y) with learning motivation (Z) greater than 0 .05. So these results indicate that there is no heteroscedasticity because the significance level results are above 0.05. This shows that the data used in this

research is suitable to prove the hypothesis's truth in subsequent statistical tests. Multiple linear regression is a regression model that involves more than one independent variable. Multiple linear regression analysis was carried out to determine the direction and how much influence the independent variable has on the dependent variable.

Table 6. Multiple Linear Regression Test

Coefficients^a					
Model	Unstandardized Coefficients		Standardized Coefficients		Sig.
	B	Std. Error	Beta	t	
1 (Constant)	54.687	6.531		8.374	.000
X1	.144	.090	.098	1.602	.110
X2	.198	.083	.148	2.392	.017
X3	-.062	.121	-.036	-.514	.608
X4	.294	.118	.171	2.486	.014
X5	.119	.177	.075	.673	.502
Z	.048	.142	.036	.339	.735

a. Dependent Variable: Y

Based on the multiple linear regression equation, it can be concluded that the constant value of 54.687 indicates that if the variables are teacher technological ability (X_1), parental support (X_2), teacher competence (X_3), learning environment (X_4), learning interest (X_5), and learning motivation (Z) is worth zero, then learning outcomes (Y) will be worth 54.687. The regression coefficient value for teacher technology ability (X_1) is 0.144, indicating that a one-unit increase in teacher technology ability will increase learning outcomes by 0.144 units. Parental support (X_2) has a regression coefficient of 0.198, meaning that a one-unit increase in parental support will increase learning outcomes by 0.198 units. Teacher competency (X_3) has a regression coefficient of -0.026, indicating that a one-unit reduction in teacher competency will reduce learning outcomes by 0.026 units. Learning environment (X_4) has a regression coefficient of 0.294, meaning that a one-unit increase in the learning environment will increase learning outcomes by 0.294 units. Learning interest (X_5) has a regression coefficient of 0.119, indicating that a one-unit increase in learning interest will increase learning outcomes by 0.119 units. Finally, learning motivation (Z) has a regression coefficient of 0.048, meaning that a one-unit increase in learning motivation will increase learning outcomes by 0.048. The partial regression test (t) functions to determine whether the partial independent variable regression model significantly affects the dependent variable (Ghozali, 2016).

Table 7. T-Test Results for Independent Variable (X) Against Dependent Variable (Y)

Variables	t	sig.	Information
Teacher Technology Capabilities (X_1) Regarding Learning Outcomes (Y)	1.602	.110	Not significant
Parental Support (X_2) Regarding Learning Outcomes (Y)	2.392	.017	Significant
Teacher Competency (X_3) Regarding Learning Outcomes (Y)	-.514	.608	Not significant
Learning Environment (X_4) Regarding Learning Outcomes (Y)	2.486	.014	Significant
Interest to learn (X_5) Regarding Learning Outcomes (Y)	.673	.502	Not significant

Based on the results above, teachers' technological abilities do not influence learning outcomes, with a significant value of 0.110. Parental support significantly influences learning outcomes, with a value of 0.017. Teacher competence does not influence learning outcomes, with a significant value of 0.608. The learning environment significantly influences learning outcomes, with a significant value of 0.014, but there is no influence of interest in learning on learning outcomes, with a significant value of 0.502.

Table 8. T-test results of Independent Variable (X) on Moderating Variable (Z)

Variables	t	sig.	Information
Teacher Technology Capabilities (X_1) Against Learning Motivation (Z)	3.726	.000	Significant
Parental Support (X_2) Against Learning Motivation (Z)	4.225	.000	Significant
Teacher Competency (X_3) Against Learning Motivation (Z)	8.295	.000	Significant
Learning Environment (X_4) Against Learning Motivation (Z)	6.821	.000	Significant
Interest to learn (X_5) Against Learning Motivation (Z)	24.691	.000	Significant

Based on the results above, there is an influence of teacher technological ability on learning motivation with a significant value of 0.000. There is an influence of parental support on learning motivation with a significant value of 0.000, and there is an influence of teacher competence on learning motivation with a

significant value of 0.000. There is an influence of the learning environment on learning motivation with a significant value of 0.000, and there is an influence of interest in learning on learning motivation with a significant value of 0.000. The coefficient of determination test (R^2) measures the model's ability to explain variations in the independent variables.

Table 9. Coefficient of Determination Test Results (R^2)

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.339 ^a	0,115	0,095	8,69175
a. Predictors: (Constant), Z, X1, X2, X4, X3, X5				

Based on the table above, the calculated R Square (R^2) value is 0.095 (9.5%). This explains the influence of the variables teacher technological ability (X_1), parental support (X_2), teacher competence (X_3), learning environment (X_4), and learning interest (X_5) on learning outcomes (Y) with learning motivation (Z) as a variable moderation was 9.5%. In contrast, other variables outside the research explained the rest. The Sobel test measures whether a moderating variable mediates the relationship between a model's independent and dependent variables.

Table 10. Independent Variable Sobel Test Results (X) → Moderating Variables (Z) → Dependent Variable (Y)

Variables	Sobel Results	Information
Teacher Technology Capabilities (X_1) → Learning Motivation (Z) → Learning Outcomes (Y)	2.2961	Able to Mediate
Parental Support (X_2) → Learning motivation (Z) → Learning outcome (Y)	2.2045	Able to Mediate
Teachers' competency (X_3) → Learning motivation (Z) (Z) → Learning outcome (Y)	2.4699	Able to Mediate
Learning Environment (X_3) → Learning motivation (Z) (Z) → Learning outcome (Y)	1.8568	Unable to Mediate
Learning Interest (X_3) → Learning motivation (Z) (Z) → Learning outcome (Y)	0.4206	Unable to Mediate

Based on the results above, the learning motivation variable can moderate the influence of teacher technological abilities, parental support, and teacher competence on learning outcomes with respective Sobel test results of 2.2961, 2.2045, 2.4699. The learning motivation variable cannot moderate the influence of the learning environment and learning interest on learning outcomes. The regression coefficient value b_1 for the teacher technology ability variable (X_1) is 0.144, meaning that if the coefficient b_1 value increases by 0.094 units, then the Y value will increase by 0.144 units. It can be interpreted that increasing the teacher's technological abilities will improve student learning outcomes. Based on the results of the t-test in the statistical table, it can be seen that in the teacher technology ability variable (X_1), t_{count} is $(1.226) < t_{table}$, (1.968), meaning that H_0 is accepted and H_a is rejected. So, there is no significant influence between the teacher technology ability variable (X_1) and the learning outcome variable (Y). Based on the probability value, the sig value for the teacher technology ability variable is $0.110 > 0.05$, so H_0 is accepted, and H_a is rejected, meaning that there is no significant influence between the teacher technology ability variable (X_1) and the learning outcome variable (Y). Therefore, H_1 is rejected. Teachers' technological abilities are indeed an important factor in learning. However, they do not always directly affect learning outcomes for several reasons, such as the use of sophisticated technology not being effective if the teaching methods do not meet students' needs. Even if using advanced technology, the wrong method can affect students' understanding. Students must also have basic technology skills to use the learning devices or applications the teacher uses. If students are not ready, then technology will not have a significant impact. Student interaction and involvement in the learning process often influence learning outcomes. Teachers who can create an interactive learning environment and actively involve students will be more effective than just using technology.

Parental support is support provided by people around a person in the form of emotional, informational, and mentoring support, which aims to enable individuals to face all the problems that occur in everyday life (Saputri et al., 2022). The regression coefficient b_2 value for the parental support variable (X_2) is 0.198, meaning that if the b_2 coefficient value increases by 0.198 units, then the Y value will increase by 0.198 units. It can be interpreted that increasing parental support will improve student learning outcomes. Based on the results of the t-test in the statistical table, it can be seen that in the parental support variable (X_2), we get t_{count} (2.392) $> t_{table}$, (1.968), meaning that H_0 is rejected and H_a is accepted. So, a significant influence exists between the parental support variable (X_2) and the learning outcome variable (Y). Based on the probability value, the sig

value of the parental support variable (X_2) is $0.017 < 0.05$, so H_0 is rejected, and H_a is accepted, meaning that there is a significant influence between the parental support variable (X_2) and the learning outcome variable (Y), by therefore H_2 is accepted. The results of this research align with Saputri et al. (2022) who state that parental support influences learning outcomes. Parental support is important for students' academic progress and achievement in education and child development literature.

According to Febriana (2019), competency comes from the word competency (English), which means ability, capability, proficiency, qualification, eligibility, readiness, skill, and adequacy (equivalence). In line with this opinion, Wulandari and Hendriani (2021) explain that competence is knowledge, skills, and basic values reflected in habits of thinking and acting consistently and continuously to enable someone to be competent in the sense of having knowledge skills (Anwar, 2018). The regression coefficient b_3 value for the teacher competency variable (X_3) is -0.062 , meaning that if the b_3 coefficient decreases by 0.062 units, the Y value will decrease by 0.062 units. It can be interpreted that decreasing teacher competence will reduce student learning outcomes. Based on the results of the t-test in the table statistics, it can be seen that for the teacher competency variable (X_3) obtained $t_{count} (-0.514) < t_{table} (1.968)$, meaning that H_0 is accepted and H_a is rejected, so there is no significant influence between the teacher competency variable (X_3) with the learning outcome variable (Y). Based on the probability value, the sig value for the teacher competency variable is $0.608 > 0.05$, so H_0 is accepted, and H_a is rejected, meaning that there is no significant influence between the teacher competency variable (X_3) and the learning outcome variable (Y). Therefore, H_3 is rejected. Even though teacher competence is critical, there are still many factors that influence student learning outcomes that must also be considered in order to achieve optimal learning outcomes, one of which is that students who are not mentally or emotionally ready to learn will have difficulty understanding the material, even though competent teachers. Lack of adequate learning facilities in schools can be an obstacle, even though teachers have high qualifications. Teaching methods that do not suit students' learning styles can reduce learning effectiveness. Even highly competent teachers may need to adapt teaching methods for different types of students.

The learning environment is an external factor that can influence the development of each student in the learning process (Andrian et al., 2022; Maisaroh et al., 2023). The learning environment is not only focused on good facilities but also needs to consider the comfort and tranquility of the environment (Fadhilaturrahmi, 2018). The regression coefficient b_4 value of the learning environment variable (X_4) is 0.294, meaning that if the b_4 coefficient value increases by 0.294 units, the Y value will increase by 0.294 units. It can be interpreted that improving the learning environment will improve student learning outcomes. Based on the results of the t-test in the statistical table, it can be seen that in the learning environment variable (X_4), $t_{count} (2.486) > t_{table} (1.968)$, meaning that H_0 is rejected and H_a is accepted. So, a significant influence exists between the learning environment variable (X_4) and the learning outcome variable (Y). Based on the probability value, the sig value for the learning environment variable is $0.014 < 0.05$, so H_0 is rejected, and H_a is accepted, meaning that there is a significant influence between the learning environment variable (X_4) and the learning outcome variable (Y), therefore H_4 is accepted. This is because a supportive and conducive environment will make students comfortable and concentrate more on studying so that the learning outcomes obtained by students can also improve due to minimal interference from the surrounding environment.

Interest is a feeling of preference and attachment to a thing or activity without anyone telling you (Nofriyandi & Andrian, 2022; Slameto, 2015). Interest is the acceptance of a relationship between oneself and something outside oneself—the stronger or closer the relationship, the greater the interest. The b_5 regression coefficient value for the learning interest variable (X_5) is 0.294, meaning that if the b_5 coefficient value increases by 0.294 units, the Y value will increase by 0.294 units. It can be interpreted that increasing interest in learning will improve student learning outcomes. Based on the results of the t-test in the statistical table, it can be seen that for the variable interest in learning (X_5) obtained $t_{count} (0.673) < t_{table} (1.968)$, meaning that H_0 is accepted and H_a is rejected, so there is no significant influence between the variable interest in learning (X_5) with the learning outcome variable (Y). Based on the probability value, the sig value of the learning interest variable is $0.502 > 0.05$, so H_0 is accepted, and H_a is rejected, meaning that there is no significant influence between the learning interest variable (X_5) and the learning outcome variable (Y). Therefore, H_5 is rejected. This is due to several difficulties experienced by students. The difficulty can be that students who do not believe in their abilities may try harder than they should, even though they are interested in the subject. Students may be interested in learning but lack the necessary materials or tools to learn well. Moreover, students who experience stress or anxiety may not be able to focus or learn effectively, regardless of their interests.

Based on the Sobel test, it can be seen that in the interaction between the variable teacher technological ability (X_1) and learning motivation (Z), $t_{count} (2.2961) > t_{table} (1.968)$, meaning that H_0 is rejected and H_a is accepted. Then, the significance value of the interaction variable was obtained at $0.021 (< 0.05)$, so it can be concluded that the learning motivation variable can moderate the influence of the teacher's technological ability variable on learning outcomes (Y). Therefore, H_6 is accepted. This research shows that student learning motivation variables can moderate the influence of technological abilities on learning outcomes. The main focus

is to optimize the positive influence of technology in learning. It is recommended that motivational training be provided to teachers to motivate them to use technology effectively. In addition, it is necessary to design learning programs that integrate motivation and technology to encourage student participation. Monitoring the interactions between these variables will help provide appropriate feedback to teachers and students, thereby increasing the overall effectiveness of learning. Although learning motivation is not a determining factor in changing the impact of technological capabilities, these steps hope that student motivation and teacher technological capabilities can work synergistically to improve student learning outcomes.

Based on the results of the Sobel test, it can be seen that in the interaction between the variable parental support (X_2) and learning motivation (Z), $t_{count} (2.2045) > t_{table} (1.968)$, meaning that H_0 is rejected and H_a is accepted. Then, the significance value of the interaction variable was obtained at $0.027 (< 0.05)$, so it can be concluded that the learning motivation variable can moderate the influence of the parental support variable (X_2) on learning outcomes (Y); therefore, H_7 is accepted. This data shows that learning motivation can moderate parental support for student learning outcomes. It can be concluded that parental support has an important role in education. Student learning motivation significantly influences the relationship between parental support and learning outcomes. Improving student learning outcomes should be focused on strengthening parental support and efforts to develop student learning motivation separately. Collaboration between schools and parents is also important to ensure a holistic understanding of student needs and effective support strategies.

Based on the results of the Sobel test, it can be seen that in the interaction between the variable teacher competence (X_3) and learning motivation (Z), $t_{count} (2.4699) > t_{table} (1.968)$, meaning that H_0 is rejected and H_a is accepted. Then, the significance value of the interaction variable was obtained at $0.013 (< 0.05)$, so it can be concluded that the learning motivation variable can moderate the influence of the teacher competency variable (X_3) on learning outcomes (Y); therefore, H_8 is accepted. This data shows that learning motivation can influence how teacher competency variables affect student learning outcomes. It can be concluded that teacher competency has an important role in learning. Motivated students are more likely to accept and apply the teaching methods used by qualified teachers. They tend to try new learning strategies taught by teachers. High learning motivation increases students' opportunities to achieve better learning outcomes. Competent teachers can provide the necessary support and guidance, but student motivation ensures they apply and absorb what they learn.

Based on the results of the Sobel test, it can be seen that in the interaction between the learning environment variables (X_4) and learning motivation (Z), $t_{count} (1.8568) < t_{table} (1.968)$, meaning that H_0 is accepted and H_a is rejected. Then, the significance value of the interaction variable was obtained at $0.063 (> 0.05)$, so it can be concluded that the learning motivation variable is not able to moderate the influence of the learning environment variable (X_4) on learning outcomes (Y); therefore, H_9 is rejected. From the research results showing that the learning motivation variable is not able to moderate the learning environment variable on student learning outcomes, it can be concluded that although the learning environment has an important role in learning, the learning motivation factor is not a determining factor that changes the direct impact of the learning environment on learning outcomes, because Learning environments can have powerful and dominant factors that are not easily overcome by motivation alone. One of these factors is that a noisy learning environment can interfere with a student's ability to concentrate, no matter how motivated. Constant noise can interfere with students' concentration and understanding of lesson material. A lack of comfortable classroom facilities and learning equipment can hinder learning. Motivated students may still have difficulty achieving good learning results if the facilities are inadequate. Another factor can be economic background; students from economically disadvantaged families may face various obstacles, such as a lack of study materials, insufficient food, or difficulty working to support the family. This condition can reduce the effectiveness of learning motivation.

Based on the results of the Sobel test, it can be seen that in the interaction between the variables interest in learning (X_5) and motivation to learn (Z), $t_{count} (0.4206) < t_{table} (1.968)$, meaning that H_0 is accepted and H_a is rejected. Then, the significance value of the interaction variable is obtained at $0.674 (> 0.05)$, so it can be concluded that the learning motivation variable is not able to moderate the influence of the learning interest variable (X_5) on learning outcomes (Y); therefore, H_{10} is rejected. From the research results, which show that the learning motivation variable is not able to moderate the influence of the learning interest variable on student learning outcomes, it can be concluded that although learning interest has an important role in learning, the learning motivation factor is not a determining factor that changes the direct impact of learning interest on learning outcomes. Thus, the main focus in improving student learning outcomes should be on strengthening students' interest in learning and efforts to develop students' learning motivation separately. Even though students have high motivation and interest, other factors can still hinder the learning process and results. Therefore, it is important to ensure that all factors influence the learning process, including basic abilities. Students who lack basic knowledge or necessary prerequisites will need help understanding more complex material, even if they have high interest and motivation. If the teaching method does not suit students' learning

styles or is not interesting enough, students may be unable to use their motivation and interests well. Lack of self-discipline, motivation, and interest alone are insufficient without good self-discipline. Students need to have consistent and regular study habits to achieve good results. All factors support motivation and interest in learning to play an effective role in improving learning outcomes.

CONCLUSION

Based on the results of the partial regression (t-test), it was found that Parental Support (X_2) and Learning Environment (X_4) have a significant direct influence on Learning Outcomes (Y) with p-values of 0.017 and 0.014, respectively. In contrast, Teacher Technology Capabilities (X_1), Teacher Competency (X_3), and Interest to Learn (X_5) do not show a significant direct effect on learning outcomes. However, when analyzing their impact on the moderating variable Learning Motivation (Z), all independent variables (X_1, X_2, X_3, X_4, X_5) demonstrated a significant influence with p-values of 0.000, indicating their strong effect in enhancing students' learning motivation. The coefficient of determination (R^2) value of 0.095 indicates that only 9.5% of the variance in learning outcomes can be explained by the combination of teacher technology capabilities, parental support, teacher competency, learning environment, learning interest, and learning motivation. The remaining 90.5% is influenced by other factors not examined in this study. Furthermore, the Sobel test results reveal that Learning Motivation (Z) successfully mediates the relationship between Teacher Technology Capabilities (X_1), Parental Support (X_2), and Teacher Competency (X_3) with learning outcomes. This implies that these factors indirectly influence learning outcomes by enhancing students' motivation. Conversely, learning motivation does not mediate the effect of the learning environment and interest to learn on learning outcomes, suggesting that these variables may require direct or alternative pathways to influence academic performance. Overall, this study highlights the critical role of parental support, learning environment, and learning motivation in improving student learning outcomes, emphasizing the need for holistic educational strategies that foster both external support systems and internal motivational factors.

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