



THE INFLUENCE OF CHARACTER EDUCATION, PARENTING STYLES, AND PEER ASSOCIATIONS ON MATHEMATICS LEARNING ACHIEVEMENT

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ABSTRAK

Penelitian ini bertujuan untuk: (1) menganalisis pengaruh pendidikan karakter terhadap hasil belajar, (2) menganalisis pengaruh pola asuh orang tua terhadap hasil belajar, dan (3) menganalisis pengaruh pergaulan teman sebaya terhadap hasil belajar. Penelitian ini dilakukan di SMA Muhammadiyah Mlati dengan Sampel penelitian ini yaitu 30 siswa kelas XI MIPA serta menggunakan pendekatan kuantitatif dengan metode deskriptif. Hasil analisis data menunjukkan bahwa semua faktor eksternal tersebut memiliki pengaruh positif terhadap prestasi belajar siswa. Pertama, pendidikan karakter memberikan kontribusi signifikan, di mana metode penanaman pendidikan karakter yang lebih baik berdampak pada peningkatan prestasi belajar siswa. Kedua, pola asuh orang tua yang baik, terutama dalam mendukung dan mengawasi perkembangan belajar siswa, turut berperan dalam meningkatkan capaian belajar. Ketiga, pergaulan teman sebaya yang sehat dan mendukung juga memberikan dampak positif terhadap prestasi belajar siswa. Semakin baik hubungan sosial antar siswa, semakin baik pula prestasi belajar yang mereka peroleh.

ABSTRACT

This study aims to: (1) analyze the influence of character education on learning outcomes, (2) analyze the influence of parenting patterns on learning outcomes, and (3) analyze the influence of peer relationships on learning outcomes. This study was conducted at Muhammadiyah Mlati Senior High School with a sample of 30 students of grade XI Natural Sciences and using a quantitative approach with a descriptive method. The results of the data analysis showed that all of these external factors had a positive influence on student learning achievement. First, character education made a significant contribution, where better character education instillation methods had an impact on improving student learning achievement. Second, good parenting patterns, especially in supporting and supervising student learning development, also played a role in improving learning achievement. Third, healthy and supportive peer relationships also had a positive impact on student learning achievement. The better the social relationships between students, the better the learning achievement they obtained.

1. INTRODUCTION

Education is one of the key elements in the development of a nation (Aulia et al., 2023). The success of education is determined not only by students' cognitive abilities but also by character building, parenting styles, and the social environment, including peer interactions. In the context of mathematics learning, these factors become even more relevant, as mathematics is often perceived as a challenging subject that requires discipline, dedication, and adequate support from the students' surroundings (Alghiffari et al., 2024). This presents a unique challenge for both students and educators to create a supportive learning atmosphere, especially in overcoming the stigma that mathematics is a complicated and difficult subject to grasp (Syah et al., 2024).

Character education is an integral part of the educational process (Amir, 2020). By fostering traits such as honesty, responsibility, hard work, and self-confidence, students are better equipped to face challenges in learning, including understanding complex mathematical concepts (Siswanto & Afandi, 2024). Character education not only serves as a moral foundation but also as a motivational driver that helps students persevere in overcoming learning difficulties. Good character education can motivate students to put in more effort, thereby improving their learning achievements, particularly in subjects requiring logical and analytical thinking, like mathematics. This underscores that character development impacts not only social aspects but also students' academic achievements (Widyastuti et al., 2024).

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In addition to character education, parenting styles significantly influence children's development, including their academic performance (Astiwi & Siswanto, 2024). Parents who provide emotional support, pay attention to their children's educational needs, and create a conducive learning environment at home can help their children achieve optimal learning outcomes. Conversely, unsupportive parenting styles, such as lack of supervision or excessive pressure, can hinder children's ability to learn effectively. Supportive parenting enables children to feel valued and motivated to study harder, whereas poor parenting can create stress that inhibits children from maximizing their learning potential (Mastikawati et al., 2022).

Another equally important factor is peer associations. Peer interactions can influence students' attitudes, motivation, and study habits (Zurriyati & Mudjiran, 2021). Peers who are highly dedicated and interested in education can encourage students to perform better (Yogyanto et al., 2024). However, if a student frequently associates with peers who do not support learning activities, this can reduce their focus and motivation to achieve good academic performance. In this context, peers can act as motivators or, conversely, as obstacles in students' learning. Therefore, a supportive social environment is crucial to fostering positive learning habits (Siswanto et al., 2024).

In mathematics learning, the combined influence of character education, parenting styles, and peer associations is evident (Tarso et al., 2024). Mathematics requires deep understanding, concentration, and hard work all of which are influenced by these three factors (Siswanto & Andriyani, 2024). A disciplined and persistent student character, consistent parental support, and a positive social environment can significantly contribute to students' ability to master mathematical material. Without the synergy of these factors, students may struggle to understand the abstract and complex concepts of mathematics (Putri et al., 2024).

However, many students across various educational levels face difficulties in learning mathematics, often due to a lack of support from these three factors. For instance, insufficient parental attention, negative peer influence, or the absence of strong character-building initiatives at school can become major obstacles in the mathematics learning process (Saputra et al., 2024). These challenges are exacerbated by limited access to adequate learning resources, leading students to feel insecure about exploring mathematical concepts in-depth. As a result, their performance in this subject tends to be low, impacting their overall academic achievement (Hardi et al., 2024).

Research has shown that a holistic approach involving character education, supportive parenting, and a positive social environment can improve mathematics learning achievement (Pisriwati et al., 2024). Such an approach not only helps students grasp mathematical concepts but also builds their confidence to face academic and everyday challenges. Consistent character education fosters a resilient attitude, while supportive parenting creates a comfortable learning atmosphere at home. On the other hand, a positive peer environment provides additional motivation for students to strive for better results. The combination of these three factors enables students to confidently tackle mathematical problems that require deep analysis and complex logic (Pramestika et al., 2020).

Nevertheless, challenges in integrating these factors remain prevalent in many schools. Not all schools have successfully implemented character education effectively, and parents often lack the time to fully support their children's education (Astiwi et al., 2024). In such situations, students tend to be more influenced by peers who do not support their academic achievements. These limitations highlight the importance of synergy between schools, families, and social environments to create a learning ecosystem that supports students' success. (Biliuk & Kyrychenko, 2023) emphasizes that collaboration among these three elements can enhance the effectiveness of learning, particularly in subjects like mathematics that require intensive support.

Therefore, an in-depth study is needed to understand the extent to which character education, parenting styles, and peer associations influence students' mathematics learning achievements. The results of such studies could serve as a foundation for designing more effective learning strategies and interventions that can improve the overall quality of education. This research is particularly urgent because mathematics is one of the key subjects in educational assessment, both nationally and internationally. Understanding these factors will help educators, parents, and policymakers create a more conducive learning environment. Furthermore, the findings are expected to serve as a crucial reference for improving the quality of mathematics education, focusing not only on academic outcomes but also on the holistic development of students' character and competencies (Irvine, 2018).

2. METHODS

The research employed in this study is quantitative research. The method used is a survey method, utilizing questionnaires as the primary data collection tool. The sample for this study consists of

30 students from grades XI Natural Sciences stream. To collect data, the researcher employed techniques including observation, documentation, and questionnaires, which were used to gather information regarding the influence of character education, parental upbringing, and peer interactions on students' academic achievements. The research instruments were tested for validity and reliability to ensure their appropriateness. Before conducting data analysis, the research data underwent a classical assumption test, which included tests for normality, multicollinearity, heteroscedasticity, and linearity. These preliminary tests were necessary to verify the adequacy of the data for further analysis.

3. RESULT AND DISCUSSION

This study aims to determine how much influence character education, parenting patterns and peer relationships have on the learning outcomes of students at Muhammadiyah Mlati Senior High School. The respondents studied in this study were class XI Natural Sciences by distributing 30 questionnaires and 5 questions to determine mathematics learning achievement. The results of the validity test can be seen in the following table.

Table 1. Results of X₁ Validity Test

		Correlations										
		no1	no2	no3	no4	no5	no6	no7	no8	no9	no10	Total
no1	Pearson Correlation	1	.826**	.614**	-.044	-.044	.556**	-.044	-.044	.022	.826**	.589**
	Sig. (2-tailed)		.000	.000	.818	.818	.001	.818	.818	.909	.000	.001
	N	30	30	30	30	30	30	30	30	30	30	30
no2	Pearson Correlation	.826**	1	.602**	.080	.080	.367*	.080	.080	.156	1.000**	.681**
	Sig. (2-tailed)	.000		.000	.674	.674	.046	.674	.674	.410	.000	.000
	N	30	30	30	30	30	30	30	30	30	30	30
no3	Pearson Correlation	.614**	.602**	1	-.107	-.107	.390*	-.107	-.107	.074	.602**	.452*
	Sig. (2-tailed)	.000	.000		.575	.575	.033	.575	.575	.697	.000	.012
	N	30	30	30	30	30	30	30	30	30	30	30
no4	Pearson Correlation	-.044	.080	-.107	1	1.000**	.057	1.000**	1.000**	.829**	.080	.725**
	Sig. (2-tailed)	.818	.674	.575		.000	.765	.000	.000	.000	.674	.000
	N	30	30	30	30	30	30	30	30	30	30	30
no5	Pearson Correlation	-.044	.080	-.107	1.000**	1	.057	1.000**	1.000**	.829**	.080	.725**
	Sig. (2-tailed)	.818	.674	.575	.000		.765	.000	.000	.000	.674	.000
	N	30	30	30	30	30	30	30	30	30	30	30
no6	Pearson Correlation	.556**	.367*	.390*	.057	.057	1	.057	.057	.228	.367*	.494**
	Sig. (2-tailed)	.001	.046	.033	.765	.765		.765	.765	.226	.046	.006
	N	30	30	30	30	30	30	30	30	30	30	30
no7	Pearson Correlation	-.044	.080	-.107	1.000**	1.000**	.057	1	1.000**	.829**	.080	.725**
	Sig. (2-tailed)	.818	.674	.575	.000	.000	.765		.000	.000	.674	.000
	N	30	30	30	30	30	30	30	30	30	30	30
no8	Pearson Correlation	-.044	.080	-.107	1.000**	1.000**	.057	1.000**	1	.829**	.080	.725**
	Sig. (2-tailed)	.818	.674	.575	.000	.000	.765	.000		.000	.674	.000
	N	30	30	30	30	30	30	30	30	30	30	30
no9	Pearson Correlation	.022	.156	.074	.829**	.829**	.228	.829**	.829**	1	.156	.736**
	Sig. (2-tailed)	.909	.410	.697	.000	.000	.226	.000	.000		.410	.000
	N	30	30	30	30	30	30	30	30	30	30	30
no10	Pearson Correlation	.826**	1.000**	.602**	.080	.080	.367*	.080	.080	.156	1	.681**
	Sig. (2-tailed)	.000	.000	.000	.674	.674	.046	.674	.674	.410		.000
	N	30	30	30	30	30	30	30	30	30	30	30
Total	Pearson Correlation	.589**	.681**	.452*	.725**	.725**	.494**	.725**	.725**	.736**	.681**	1
	Sig. (2-tailed)	.001	.000	.012	.000	.000	.006	.000	.000	.000	.000	
	N	30	30	30	30	30	30	30	30	30	30	30

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Based on the table above, it can be seen that all question instruments in the questionnaire get a Pearson Correlation value of more than 0,361, so it can be said that the instrument on the Character Education variable (X₁) is valid. The following table shows the results of the validity test of the parenting pattern instrument (X₂) which can be seen in the following table.

Table 2. Results of X₂ Validity Test

		Correlations										
		no1	no2	no3	no4	no5	no6	no7	no8	no9	no10	Total
no1	Pearson Correlation	1	.354	.474**	.302	.219	-.233	.734**	.140	.195	-.233	.527**
	Sig. (2-tailed)		.055	.008	.105	.245	.215	.000	.460	.303	.215	.003
	N	30	30	30	30	30	30	30	30	30	30	30
no2	Pearson Correlation	.354	1	-.026	.530**	-.044	.188	.133	.770**	.140	.188	.599**
	Sig. (2-tailed)	.055		.893	.003	.816	.319	.483	.000	.462	.319	.000
	N	30	30	30	30	30	30	30	30	30	30	30
no3	Pearson Correlation	.474**	-.026	1	.208	.235	-.044	.409*	.017	.228	-.044	.458*
	Sig. (2-tailed)	.008	.893		.269	.212	.817	.025	.928	.226	.817	.011
	N	30	30	30	30	30	30	30	30	30	30	30
no4	Pearson Correlation	.302	.530**	.208	1	.091	.006	.362*	.740**	.379*	.006	.644**
	Sig. (2-tailed)	.105	.003	.269		.633	.974	.049	.000	.039	.974	.000
	N	30	30	30	30	30	30	30	30	30	30	30
no5	Pearson Correlation	.219	-.044	.235	.091	1	.125	.385*	.118	.245	.125	.460*
	Sig. (2-tailed)	.245	.816	.212	.633		.510	.036	.533	.192	.510	.011
	N	30	30	30	30	30	30	30	30	30	30	30
no6	Pearson Correlation	-.233	.188	-.044	.006	.125	1	-.193	.163	.050	1.000**	.466**
	Sig. (2-tailed)	.215	.319	.817	.974	.510		.308	.390	.791	.000	.009
	N	30	30	30	30	30	30	30	30	30	30	30
no7	Pearson Correlation	.734**	.133	.409*	.362*	.385*	-.193	1	.375*	.095	-.193	.551**
	Sig. (2-tailed)	.000	.483	.025	.049	.036	.308		.041	.616	.308	.002
	N	30	30	30	30	30	30	30	30	30	30	30
no8	Pearson Correlation	.140	.770**	.017	.740**	.118	.163	.375*	1	.138	.163	.659**
	Sig. (2-tailed)	.460	.000	.928	.000	.533	.390	.041		.468	.390	.000
	N	30	30	30	30	30	30	30	30	30	30	30
no9	Pearson Correlation	.195	.140	.228	.379*	.245	.050	.095	.138	1	.050	.453*
	Sig. (2-tailed)	.303	.462	.226	.039	.192	.791	.616	.468		.791	.012
	N	30	30	30	30	30	30	30	30	30	30	30
no10	Pearson Correlation	-.233	.188	-.044	.006	.125	1.000**	-.193	.163	.050	1	.466**
	Sig. (2-tailed)	.215	.319	.817	.974	.510	.000	.308	.390	.791		.009
	N	30	30	30	30	30	30	30	30	30	30	30
Total	Pearson Correlation	.527**	.599**	.458*	.644**	.460*	.466**	.551**	.659**	.453*	.466**	1
	Sig. (2-tailed)	.003	.000	.011	.000	.011	.009	.002	.000	.012	.009	
	N	30	30	30	30	30	30	30	30	30	30	30

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Based on the table above, it can be seen that all question instruments in the questionnaire get a Pearson Correlation value of more than 0.361, so it can be said that the instrument on the parenting pattern variable (X₂) is valid. The following table shows the results of the validity test of the peer interaction variable instrument (X₃) which can be seen in the following table.

Table 3. Results of X₃ Validity Test

		Correlations										
		no1	no2	no3	no4	no5	no6	no7	no8	no9	no10	Total
no1	Pearson Correlation	1	.265	.550**	.241	.306	-.168	.661**	.028	.284	-.206	.516**
	Sig. (2-tailed)		.156	.002	.199	.100	.376	.000	.884	.129	.275	.003
	N	30	30	30	30	30	30	30	30	30	30	30
no2	Pearson Correlation	.265	1	.068	.570**	-.034	.366*	.140	.582**	.372*	.145	.612**
	Sig. (2-tailed)	.156		.719	.001	.858	.047	.461	.001	.043	.444	.000
	N	30	30	30	30	30	30	30	30	30	30	30
no3	Pearson Correlation	.550**	.068	1	.322	.263	-.014	.508**	.060	.273	-.012	.542**
	Sig. (2-tailed)	.002	.719		.083	.160	.942	.004	.752	.145	.950	.002
	N	30	30	30	30	30	30	30	30	30	30	30
no4	Pearson Correlation	.241	.570**	.322	1	.129	.256	.378*	.542**	.533**	-.008	.685**
	Sig. (2-tailed)	.199	.001	.083		.497	.173	.039	.002	.002	.966	.000
	N	30	30	30	30	30	30	30	30	30	30	30
no5	Pearson Correlation	.306	-.034	.263	.129	1	.171	.313	.037	.285	.056	.453*
	Sig. (2-tailed)	.100	.858	.160	.497		.367	.092	.847	.128	.770	.012
	N	30	30	30	30	30	30	30	30	30	30	30
no6	Pearson Correlation	-.168	.366*	-.014	.256	.171	1	-.029	.252	.257	.796**	.561**
	Sig. (2-tailed)	.376	.047	.942	.173	.367		.878	.178	.171	.000	.001
	N	30	30	30	30	30	30	30	30	30	30	30

no7	Pearson Correlation	.661**	.140	.508**	.378*	.313	-.029	1	.264	.219	-.143	.575**
	Sig. (2-tailed)	.000	.461	.004	.039	.092	.878		.159	.245	.452	.001
	N	30	30	30	30	30	30	30	30	30	30	30
no8	Pearson Correlation	.028	.582**	.060	.542**	.037	.252	.264	1	.254	.355	.592**
	Sig. (2-tailed)	.884	.001	.752	.002	.847	.178	.159		.176	.054	.001
	N	30	30	30	30	30	30	30	30	30	30	30
no9	Pearson Correlation	.284	.372*	.273	.533**	.285	.257	.219	.254	1	.012	.609**
	Sig. (2-tailed)	.129	.043	.145	.002	.128	.171	.245	.176		.951	.000
	N	30	30	30	30	30	30	30	30	30	30	30
no10	Pearson Correlation	-.206	.145	-.012	-.008	.056	.796**	-.143	.355	.012	1	.410*
	Sig. (2-tailed)	.275	.444	.950	.966	.770	.000	.452	.054	.951		.024
	N	30	30	30	30	30	30	30	30	30	30	30
Total	Pearson Correlation	.516**	.612**	.542**	.685**	.453*	.561**	.575**	.592**	.609**	.410*	1
	Sig. (2-tailed)	.003	.000	.002	.000	.012	.001	.001	.001	.000	.024	
	N	30	30	30	30	30	30	30	30	30	30	30

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Based on the table above, it can be seen that all question instruments in the questionnaire get a Pearson Correlation value of more than 0,361, so it can be said that the instrument on the peer interaction variable (X_3) is valid. The following table shows the results of the validity test of the mathematics learning achievement variable instrument (Y) which can be seen in the following table.

Table 4. Results of Y Validity Test

		Correlations					
		no1	no2	no3	no4	no5	Total
no1	Pearson Correlation	1	.244	.550**	.241	.306	.755**
	Sig. (2-tailed)		.194	.002	.199	.100	.000
	N	30	30	30	30	30	30
no2	Pearson Correlation	.244	1	.031	.527**	-.088	.516**
	Sig. (2-tailed)	.194		.871	.003	.644	.004
	N	30	30	30	30	30	30
no3	Pearson Correlation	.550**	.031	1	.322	.263	.707**
	Sig. (2-tailed)	.002	.871		.083	.160	.000
	N	30	30	30	30	30	30
no4	Pearson Correlation	.241	.527**	.322	1	.129	.676**
	Sig. (2-tailed)	.199	.003	.083		.497	.000
	N	30	30	30	30	30	30
no5	Pearson Correlation	.306	-.088	.263	.129	1	.514**
	Sig. (2-tailed)	.100	.644	.160	.497		.004
	N	30	30	30	30	30	30
Total	Pearson Correlation	.755**	.516**	.707**	.676**	.514**	1
	Sig. (2-tailed)	.000	.004	.000	.000	.004	
	N	30	30	30	30	30	30

** . Correlation is significant at the 0.01 level (2-tailed).

Based on the table above, it can be seen that all question instruments in the questionnaire get a Pearson Correlation value of more than 0,361, so it can be said that the instrument on the mathematics learning achievement variable (Y) is valid. After the four instruments are said to be valid, their reliability will be tested. The following is a table of the results of the reliability test of the instrument variables X_1 , X_2 , X_3 , and Y.

Table 5. Results of Reliability Tests X_1 , X_2 , X_3 , and Y

Reliability Statistics		
Variable	Cronbach's Alpha	N of Items
X_1	.849	10
X_2	.701	10
X_3	.741	10
Y	.630	5

Based on the results of the reliability test above, it can be seen that the four variables, namely character education (X_1), parenting patterns (X_2), peer relationships (X_3), and mathematics learning

achievement (Y) obtained a Chronbach alpha value of more than 0,05, so it can be said that the four variables are reliable.

Table 6. Normality Test Results
One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		30
Normal Parameters ^{a,b}	Mean	.0000000
	Std. Deviation	5.70491474
Most Extreme Differences	Absolute	.143
	Positive	.096
	Negative	-.143
Test Statistic		.143
Asymp. Sig. (2-tailed)		.120 ^c

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

Based on the table above, it can be seen that the asymp.sig.(2-tailed) value in the Kolmogorov-Smirnov test is 0,120, so it can be said to be normal. Furthermore, multicollinearity was tested with the results as shown in the following table.

Table 7. Multicollinearity Test Results

		Coefficients ^a						
		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Tolerance	Statistics VIF
Model		B	Std. Error	Beta				
1	(Constant)	-4.521	9.682		.467	.644		
	X ₁	.226	.095	.228	2.389	.024	.823	1.216
	X ₂	.134	.117	.111	1.137	.266	.781	1.280
	X ₃	.967	.103	.859	9.402	.000	.900	1.112

a. Dependent Variable: Y

The results of the multicollinearity test in this study showed that the VIF value of the character education variable was 1,216, parenting patterns were 1,280 and peer relationships were 1,112, where the three variables were <10,00, so it can be concluded that there is no multicollinearity between the variables.

Table 8. Heteroscedasticity Test Results

Table 8. Hierarchical Regression Test Results								
		Coefficients ^a						
		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
Model		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-6.158E-15	9.682		.000	1.000		
	X ₁	.000	.095	.000	.000	1.000	.823	1.216
	X ₂	.000	.117	.000	.000	1.000	.781	1.280
	X ₃	.000	.103	.000	.000	1.000	.900	1.112

a. Dependent Variable: Abs_RES

The results of the heteroscedasticity test are seen in each variable X₁, X₂, X₃, all three have a sig. value of 1,000 > 0,05 so it can be concluded that there is no heteroscedasticity.

Table 9. Linearity Test Results

Model Summary ^b					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.897 ^a	.805	.782	6.02506	.964

a. Predictors: (Constant), X₃, X₁, X₂

b. Dependent Variable: Y

The results of the linearity test using the Durbin-Watson SPSS-25 test which is a method to determine whether or not there is autocorrelation in a regression model. The model is declared linear if

$(4 - dw) > du$. The results of the linearity test in this study are $(4 - dw = 4 - 0,964 = 3,036)$, seen from the Durbin-Watson table, $du = 1,650$ and $dl = 1,214$. Because the value of $(4 - dw) > du$ is $3,036 > 1,650$, it is concluded that the model is linear. Furthermore, a multiple regression analysis test was carried out in this study aimed to determine how much influence character education, parenting patterns and peer relationships have on learning outcomes. The results of the analysis are presented in the following table.

Table 10. Multiple Linear Regression Test Results

		Coefficients ^a				
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	4.521	9.682		.467	.644
	X ₁	.226	.095	.228	2.389	.024
	X ₂	.234	.117	.211	2.137	.026
	X ₃	.967	.103	.859	9.402	.000

a. Dependent Variable: Y

Based on the table, the multiple regression equation is obtained as follows::
 $Y = 4,521 + 0,226X_1 + 0,234X_2 + 0,967X_3$

The equation can be explained as follows: When the variables of character education, parenting, and peer interaction are zero, then student learning achievement is estimated at 4,521. The regression coefficient of the character education variable of 0,226 indicates a positive influence of character education on student learning achievement. The regression coefficient of the parenting variable of 0,234 also indicates a positive influence. The regression coefficient of the peer interaction variable of 0,967 indicates a positive influence of peer interaction on student learning achievement. The determination coefficient test aims to determine the extent of the contribution of the independent variable to the dependent variable. The results of the determination coefficient test are presented in the following table.

Table 11. Results of the Determination Coefficient Test

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.897 ^a	.805	.782	6.02506

a. Predictors: (Constant), X₃, X₁, X₂

Based on the table, the R square value of 0,805 indicates that the contribution of the independent variables to the dependent variable is relatively small or close to zero. This indicates that character education, parenting patterns, and peer relationships only affect student learning achievement at Muhammadiyah Mlati Senior High School by 80,5%. The rest, which is 19,5%, is influenced by various other variables. Furthermore, a partial t-test was conducted to determine the partial influence of each independent variable on the dependent variable, a variable is considered to have a positive influence if the t-count value is greater than the t-table. With degrees of freedom (df) of $n - k = 30 - 3 = 27$ and a significance level of 5%, the t-table value obtained is 2,052.

Table 12. t-Test Results

Variable	t _{count}	t _{table}	Description
Character Education	2,389	2,052	Hypothesis accepted
Parenting Styles	2,137	2,052	Hypothesis accepted
Peer Associations	9,402	2,052	Hypothesis accepted

Based on the results of the t-test, the t_{count} value for the character education variable is 2,389, which is greater than the t_{table} value of 2,052. This shows that character education has a positive influence on student learning achievement. This study is in line with Atmaja (2023), Catalano et al. (2023) and Supa'at & Ihsan (2023) who stated that character education has a positive and significant influence on student learning achievement. In addition, Samsinar et al. (2023) and Yusutria et al. (2021) also found that discipline character education significantly affects student learning achievement. Based on the results of the t-test, the t_{count} for the parenting variable is 2,137, greater than the t_{table} of 2,052. This proves that parenting has a positive influence on student learning achievement. This finding is supported by Syafira (2021) and Toader (2023) who concluded that parenting significantly affects student learning

achievement, and Vasiou et al. (2023) who found that parenting positively and significantly affects student learning achievement. The results of the t-test show that the calculated t_{count} for the peer interaction variable is 9,402, which is greater than the t_{table} of 2,052. This confirms that peer interaction has a positive influence on student learning achievement. Research by Almusaed et al. (2023) and Guidotti et al. (2023) supports these results, with the conclusion that peer interaction has a positive and significant influence on student learning achievement in various subjects at different levels of education.

4. CONCLUSION

Based on the research conducted, it can be concluded that character education, parenting patterns, and peer relationships have a positive influence on the learning achievement of grade XI Natural Sciences students at Muhammadiyah Mlati Senior High School. Instilling good character education has a significant impact on improving student learning achievement. Appropriate parenting patterns, especially in supporting and supervising children's learning development, have also been shown to positively improve learning achievement. In addition, healthy and supportive peer relationships play an important role in forming a conducive learning environment. Schools as formal educational institutions are expected to improve methods of instilling character education, utilize technology such as mobile phones wisely in learning, and establish good communication with students' parents. Students are also expected to be able to carry out their responsibilities in learning, apply character education values, and build good relationships with parents and peers to support their learning success. However, this study has several limitations that need to be considered. The research respondents were limited to grade XI Natural Sciences students with a sample size of 30 students, so the scope of the study was considered less comprehensive. The assessment is only based on students filling out questionnaires without involving assessments from the school or parents, which can provide a more objective perspective. In addition, this study only examines external factors such as character education, parenting patterns, and peer relationships, while internal factors such as learning motivation, discipline, emotional intelligence, and learning resources have not been taken into account.

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