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## **The Correlations of Students' Communication Skill and Social Environment with Students' Science Achievement in Junior High School**

**Leni Purwati<sup>1</sup>, Tias Ernawati<sup>2</sup>, Hidayati<sup>3</sup>**

<sup>1</sup>Pendidikan IPA Universitas Sarjanawiyata Tamansiswa, Indonesia

<sup>3</sup>Pendidikan Fisika Universitas Sarjanawiyata Tamansiswa, Indonesia

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## The Correlations of Students' Communication Skill and Social Environment with Students' Science Achievement in Junior High School

Leni Purwati<sup>1</sup>, Tias Ernawati<sup>2</sup>, Hidayati<sup>3</sup>

<sup>1,2</sup>Pendidikan IPA Universitas Sarjanawiyata Tamansiswa, Indonesia

<sup>3</sup>Pendidikan Fisika Universitas Sarjanawiyata Tamansiswa, Indonesia

<sup>1</sup>tias.ernawati@ustjoja.ac.id

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### Abstract

Science learning achievement is influenced by two factors, namely internal factors and external factors. Internal factors which include physiological and psychological factors. While external factors are factors that come from outside the student, these factors include family, school, and community factors. The purpose of this research is to show the correlative relationship between communication skills and the social environment with science learning achievement of 8th grade students at SMP Taman Dewasa throughout Umbulharjo Subdistrict of Yogyakarta. Data collection techniques in this study use questionnaires and tests. Descriptive analysis techniques from ideal curves and multiple regression of 2 predictors and analysis with partial analysis are used to analysis the data. Correlative research results obtained  $r$  count = 0.749 with  $p = 0.000$ , which means that there is a positive and very significant relationship between communication skills and the social environment with the science learning achievement of 8th grade students, both together and independently. The results also show the amount of effective contribution (SE), each of which came from the communication skills variable  $X_1 = 27.9\%$  and the social environment  $X_2 = 29.6\%$ .

**Keywords: Communication Skill, Social Environment, Science, Science Achievement**

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### Introduction

Viewed from external factors, adult education in Indonesia has got progress in all aspects including the learning process, the quality and quantity of teachers, learning facilities and infrastructure. This success cannot be separated from good, effective and efficient teaching and learning activities in the classroom. The teacher also plays an important role because of the method he or she uses in the learning processes can influence the success or failure of the learning processes. Natural science is a field of study whose aim is to equip students with developing their sciences through materials that contain many things related to knowledge exploration in real life.

The result of the whole processes of learning is a learning achievement. Achievement is the real capacity that results from interactions between the various factors that affect both internal and external aspects of individuals in the research (Sardiman, 2001). Learning achievement is the realization or the expansion of potential skills or capacity of a person (Sukmadinata, 2009). Observations showed that determined Minimum Completeness Criterion (KKM) in Taman Dewasa Junior High Schools throughout Umbulharjo Subdistrict of Yogyakarta was 75; whereas the average score of daily tests for eighth grade students in science subject at the same Schools was 65. This indicates that the average score of natural science subjects was still under the KKM.

Natural science students' learning achievement is influenced by internal and external factors. Internal factors include physiological and psychological factors. Meanwhile external factors are derived from family, school, and community. An internal factor susceptible to affect the learning achievement of natural science is communication skills. Every learning process requires communication skills. Communication is regarded as a two-way process in which the learners must be able to communicate their ideas and understand the communications of others.

In addition to communication skills, another alleged factor that affects natural science students' learning achievement is an external factor such as social environment. The social environment affects learning achievement through social support. Social support is a physical and psychological comfort provided by a friend, family members or residences from the surrounding environment (Baron & Byrne, 2005). Social support can also be seen from a number of social contacts that may occur in relationship with individuals or sources in the environment.

Social support allegedly affects natural science students' achievement. Good social support from family, friends and high society are expected to improve learning achievement, especially in the natural science learning achievement. If the natural science students' achievement especially in sciences is low, it means that many students have difficulties in learning science subjects.

Referring to a major hypothesis that arises in this research, there is a positive relationship between communication skills and social environments along with the natural science students' learning achievement. The minor hypothesis shows a positive relationship between communications skills independently related to natural science students' learning achievement. In addition, there is also a positive relationship between social environments independently in line with natural science students' learning achievement.

## Method

The research was conducted in 8<sup>th</sup> grade of Taman Dewasa Junior High Schools throughout Umbulharjo Subdistrict of Yogyakarta. This is an ex post facto descriptive correlative research. Samples were taken by using a random sampling technique. The research variables consist of the independent variable (X) and the dependent variable (Y). The independent variable was twofold students' communication skills as ( $X_1$ ) and the social environments as ( $X_2$ ). The dependent variable in was the natural science learning achievement as (Y). The technique of collecting data is questionnaires, documentation, and natural science learning achievement tests. Questionnaires were tested by constructing experts' validation, product moment correlation tests to measure the validity and reliability of tests using Cronbach's Alpha. Natural science achievement test validity was tested by undertaking the product moment correlation test for either validity or reliability test using the KR-20 formula.

Data were analyzed by using descriptive and inferential analysis techniques. Identification of a propensity score of independent variables and the dependent variables deals with the criteria of a normal curve. Hypothesis testing was done by using the product moment correlation analysis and multiple correlation analysis along with two independent variables. Before performing the correlation test, the first thing to do was to test prerequisites, namely normality test and linearity relationship analysis.

## Results and Discussion

### Result

The research data concerning communications skills are required in relation to the following description. By considering the ideal mean and standard deviation, ideal normal curve criteria are elaborated, as follows:

Table 1. Frequency distribution of communications skills

No	Class Interval	Criteria	Frequency	Percentage
1	$78.375 \leq \bar{X} \leq 95.00$	Very high	1	2%
2	$64.125 \leq \bar{X} < 78.375$	High	11	22%
3	$49.875 \leq \bar{X} < 64.125$	Average	27	54%
4	$35.625 \leq \bar{X} < 49.875$	Low	11	22%
5	$19.00 \leq \bar{X} < 35.625$	Very low	0	0%
<b>Total</b>				<b>100%</b>

Table 1 shows students' communication skills that are categorized as a medium level. By considering the ideal mean and standard deviation, the ideal normal curve criteria for students' social environment data can be described, as table 2.

Table 2. Frequency distribution of social environments

No	Class Interval	Criteria	Frequency	Percentage
1	$103.125 \leq \bar{X} \leq 125.00$	Very high	0	0%
2	$84.375 \leq \bar{X} < 103.125$	High	20	40%
3	$65.625 \leq \bar{X} < 84.375$	Average	30	60%
4	$46.875 \leq \bar{X} < 65.625$	Low	0	0%
5	$25.00 \leq \bar{X} < 46.875$	Very low	0	0%
<b>Total</b>				<b>100%</b>

As Table 2 indicates, the students' social environments are regarded as a medium category. The next step to take is to identify the frequency distribution of learning achievement by using the ideal mean and standard deviation values. Thus, the trend of students' achievement is a high level category. The following table shows the frequency distribution criteria of learning achievement.

Table 3. Frequency of students' learning achievement distribution

No	Class Interval	Criteria	Frequency	Percentage
1	$20.62 \leq \bar{X} \leq 25.00$	Very high	11	22%
2	$16.87 \leq \bar{X} < 20.62$	High	30	60%
3	$13.12 \leq \bar{X} < 16.87$	Average	7	14%
4	$9.37 \leq \bar{X} < 13.12$	Low	2	4%
5	$0 \leq \bar{X} < 9.37$	Very low	0	0%
<b>Total</b>				<b>100%</b>

The results of prerequisite test analysis for the normality test in each of the research variables can be seen in the following table.

Table 4. Normality test result

Variable	Sig.	Condition	Conclusion
Communication skills	0.190	$p > 0.05$	Normal
Social environment	0.200	$p > 0.05$	Normal
Learning achievement	0.200	$p > 0.05$	Normal

In Table 4 three data of normality test results have a significant level that is greater than  $\alpha$  (0.05). Thus, it can be interpreted that all variables are either free or bound to the normal distribution of this research. Linearity test of set criteria is used to declare linearity when the score of  $F_{\text{count}} < F_{\text{table}}$  or a p-value sig.  $< 0.05$  (the standard error of 5%). The p-value sig. is a calculation value of linearity test results.

Table 5. Linearity test result

Correlation	$F_{\text{count}}$	$F_{\text{table}}$	P	Conclusion
X1 → Y	1.204	2.64	$0.326 > 0,05$	Linear
X2 → Y	0.466	2.64	$0.968 > 0,05$	Linear

From data in Table 5, because p of both variables have  $F_{\text{count}} < F_{\text{table}}$ , it means that the two research variables have a linear relationship.

The hypothesis test was conducted at the multiple correlation analysis namely Test F and R Square. F-test was used to test the independent variable (communication skills and social environment) simultaneously toward the dependent variable (the learning achievement).

Table 6. Multiple correlation analysis test of R Square model

Model	R	R Square	Adjusted R Square	Sig.
1	0.749	0.561	0.543	0.000

Table 6 shows that a multiple correlation of coefficient relationship in terms of communication skills and social environment and the natural science students' learning achievement is 0.749. When compared with  $r_{\text{table}}$  worth 0.279, the value of 0.749 indicates a very strong correlation. Significance testing can be done by using F or using p sig. Here are the results of significance testing by using F-test.

Table 7. Result of a multiple test analysis of F-test

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	583.752	2	291.876	30.082	.000 <sup>a</sup>
	Residual	456.028	47	9.703		
	Total	1039.780	49			

Predictors: (Constant), Social Environment, communications skills.

Dependent Variable: learning achievement

Based on Table 7, the result of F test significance is  $F_{\text{count}} = 30.082$  that has p value of 0.000 sig <0.01. This shows the acceptance of the hypothesis, so it can be inferred the correlation of communication skills and social environment is very significant for learning achievement. The coefficient determination is the value of the square of coefficient correlation. This is to measure the degree of relationship of communication skills and social environment variables together with the learning achievement variable. Here is the coefficient to determine the contribution of existing variables.

Table 8. Determination coefficient of communication skills, social environment and learning achievement

Variable relationship	$r_{\text{count}}$	Coefficient determination ( $r^2$ ) %
$X_1, X_2 \rightarrow Y$	0.749	56.1%

Information:

X1 : communications skills variable

X2 : social environment variable

Y : learning achievement variable

$\rightarrow$  : the role

Table 8 proves that communication skills and social environment variables contribute 56.1% to learning achievement variable. The remaining 43.9% is determined by other factors beyond the variables of related research. The analysis results using SPSS version 20 for windows show that the error rate calculation result of communication skills (X1) and the learning achievement (Y) of 0.000 is at the error level of 5%. These results indicate that the value of  $p = 0.000$  is less than the error value of 0.01 ( $0.000 < 0.05$ ), so the H1 is accepted, meaning that there is a positive and highly significant correlation between communication skills and academic achievement of natural science students.

Table 9. The analysis result of *Product Moment* ( $X_1$ ) correlation

Variable	Pearson correlation	$r_{\text{table}}$	P(sig)	Information
Communication skills – learning achievement	0.726	0.279	0.000	There is a very significant relationship.

The interpretation of correlation coefficient in Table 9 shows that  $r$  is calculated by using the score of 0.726, categorized as having a very strong correlation. Then to find out whether or not the relationship is significant, it is necessary to compare the value of  $r_{\text{count}}$  with  $r_{\text{table}}$  at the error level of 5% and  $n = 50$  is 0.279. The coefficient correlation indicates that  $r_{\text{count}}$  higher than  $r_{\text{table}}$  ( $0.726 > 0.279$ ), so there is a significant relationship. Consequently, the hypothesis is acceptable, and then the result of this research proves that there is positive and significant relationship between communication skills and natural science students' academic achievement.

Table 10. Determination coefficient of communication skills and learning achievement

Hub. Variable	$r_{\text{count}}$	Determination coefficient ( $r^2$ ) %
$X_1 \rightarrow Y$	0,726	49,9%

Information:

X1 : communication skill variable

Y : learning achievement variable

$\rightarrow$  : the role

Table 10 shows that the role of communication skills and learning achievement variables is 49.9%. The remaining 50.1% is determined by other factors beyond the related research variables. The number of effective contribution is 27.9%.

Table 11. The result of *Product Moment* ( $X_2$ ) correlation analysis

Variable	Pearson correlation	$r_{\text{table}}$	P(sig)	Information
Social environment – Learning achievement	0.707	0.279	0.000	There is a very significant relationship.

Table 11 shows that H1 is acceptable and then there is a positive and strongly significant relationship between the social environment and learning achievement. Based on the interpretation of correlation coefficient,  $r$  is calculated by the score of 0.707, categorized as having a very strong correlation. Table 12 shows that the role of social

environment and learning achievement variables is 52.8%. The remaining 47.2% is determined by other factors beyond the related research variables. The number of large effective contribution is 29.6%.

Table 12. Determination coefficient of social environment and learning achievement

Variable relationship	r <sub>count</sub>	Determination coefficient (r <sup>2</sup> ) %
X2 → Y	0.707	52.8%

Information:

X2 : social environment variable

Y : learning achievement variable

→ : the role

Furthermore, the partial correlation analysis determines the relationship between two variables whereas other variables are considered influential to be controlled or made permanent (as a control variable). Partial results of the analysis are shown in Table 13. The results of the analysis prove that there is a significant relationship between communication skills and social environment. This evidence is supported by the sig. = 0.000 < 0.01. Thus, there is a significant relationship between communication skills and natural science students' learning achievement, evidenced by the sig = 0.020 < 0.05 and there is a significant relationship between social environment and natural science students' learning achievement, along with the sig = 0.017 < 0.05.

Table 13. Partial correlation analysis between communication skills and social environment

Control Variables			Communication Skills	Social environment	Learning achievement
_none_ <sup>a</sup>	Communication Skills	Corelation	1.000	.833	.329
		Significance-(2-tailed)		.000	.020
		Df	0	48	48
	Social environment	Corelation	.833	1.000	.335
		Significance-(2-tailed)	.000		.017
		Df	48	0	48
	Achievement	Corelation	.329	.335	1.000
		Significance-(2-tailed)	.020	.017	
		Df	48	48	0
Achievement	Communication skills	Corelation	1.000	.812	
		Significance-(2-tailed)		.000	
		Df	0	47	
	Social environment	Corelation	.812	1.000	
		Significance-(2-tailed)	.000		
		df	47	0	

## Discussion

This article provides a valuable insight into a positive relationship between natural science students' communication skills and social environment and learning achievement. Descriptive communication skills of students in a category are caused by several factors. According to Thoha (2016), there are five factors that can affect communication skills, namely 1) openness, the intention to be open to someone in communicating with others; 2) a sense of empathy, feeling just what others feel; 3) support, both spoken and unspoken; 4) positivity, be positive to others; 5) similarity, recognizing the personal similarities or mutually realizing both sides in communication because both have the same right even though they may have different positions. Thus, to improve the natural students' communication skills, the school needs to develop these factors including to build openness to the entire school community, build a positive attitude by paying attention to and appreciating for high achievers, build egalitarian attitude among the whole school community. The process of communication will determine the success or failure of learning and teaching. To achieve goals is a communication successful (Ernawati et al, 2019).

The social environment is an external factor that is very important to support natural science students' achievement. The school environment, which includes the classroom, school location, school facility, school climate and technology, etc, is a variable that affects students' academic performance (Oselumese et.al, 2016). With a conducive learning environment, students will feel comfortable to learn, leading to the increase of students' achievement. Students' learning environment can be divided into three parts: the family, school and community environments. Based on these results, the tendency of students' social environment is categorized as a medium level. Therefore, efforts are made to improve the students' learning environment so that the average score can be

very good. To improve the environmental quality of students' learning, it is important to do things through three components: family, school and community environments.

Factors that affect the natural science students' learning achievement include internal factors and external factors. The tendency of natural science students' learning achievement is categorized as a high level. It is said that students have a pretty good mastery of materials. Students have thinking skills, and communication skills. Their levels of understanding are quite good and the teachers' intelligence of thinking is able to provide a good solution to solve the natural students' learning problems.

The internal factor examined in this study is communication skills, while the external factor is the learning environment. Based on the analysis, communication skills are the factors that affect students' learning achievement, because students are active not only in the classroom but also outside the classroom. Students are not only looking for information from the teacher but also from anyone who can help them in learning. Other internal factors not examined in this study that may affect students' learning achievement are psychological and motivational factors. The supported social environment will also affect the internal factor because the support of a good social environment can increase motivation to be excellent. These results are in line with the view of Johnson & Johnson (Adicondro & Purnamasari, 2011), social support is beneficial for individuals, which is able to increase work productivity. Thus, the major hypothesis testing shows that there is a positive and significant relationship between natural science students' communication skills and social environment and learning achievement.

This discussion extends knowledge of the social environment variable that becomes a stronger predictor than a variable of communication skills. Thus, the value of social environment variable is greater than that of the communication skills variable. This difference shows that a good social environment is essential and influential to improve natural science students' learning achievement to be better than usual. The role of the social environment on the success of students' achievement is quite influential. The social environment contributes to a positive influence to improve students' achievement. By contrast, if the social environment is unfavorable, it would be a negative impact on students' achievement. This result is opposite to Lawrence's eksperiment which show that there was no significant relationship between School Environment and Academic Achievement of standard IX students (Lawrence & Vimala, 2012).

## Conclusion

The tendency of students' communication skills is in the medium category, while the students' social environment is in the medium category. The tendency of students' achievement is in the high category. There is a positive and very significant relationship between communication skills and social environment and natural science students' learning achievement. There is a positive and very significant relationship between communication skills and students' achievement, along with an effective contribution of 27.9%. There is a positive and very significant relationship between social environment and students' achievement, along with a contribution of 29.6%.

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### **Authors Information**

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**Leni Purwati**

Pendidikan IPA Universitas Sarjanawiyata Tamansiswa  
Jl. Batikan UH III/1043 Yogyakarta

**Tias Ernawati**

Pendidikan IPA Universitas Sarjanawiyata Tamansiswa  
Jl. Batikan UH III/1043 Yogyakarta

Contact :

E-mail Address: [tias.ernawati@ustjogja.ac.id](mailto:tias.ernawati@ustjogja.ac.id)

**Hidayati**

Pendidikan Fisika Universitas Sarjanawiyata Tamansiswa  
Jl. Batikan UH III/1043 Yogyakarta

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