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Correlation Analysis between External Factors and Students' Physics Learning Achievement

Karyadi[a], Iriwi L.S. Sinon[a], Irfan Yusuf[a], Sri Wahyu Widyaningsih[ax]

[a]Physics Education Department FKIP Universitas Papua, Papua Barat, 98314, Indonesia

[x]Corresponding author: KPR BTN Griya Amban Pantai Permai Blok A No 7, Manokwari, Papua Barat, 98314, Indonesia. E-mail addresses: s.widyaningsih@unipa.ac.id

A b s t r a c t

This research was conducted to determine whether there is 1) the correlation between the sthe family condition and learning achievement, 2) the correlation between the schoolcondition and learning achievement, 3) the correlation between communities and learning achievement, and 4) the correlation between the condition of the family, school and community environment and learning achievement. This research is associative quantitative correlational analysis techniques. The results showed that there is a positive correlation between the condition of the family and learning achievement, the result of the calculation shows that r table> count r ie 0.51 > 0.38, 2); there is a positive correlation between the school condition and learning achievement, the result of the calculation shows that r count> r table is 0.39 > 0.38, 3); there is a positive correlation between communities and learning achievement, it is shown from the results of calculations, that the count r> r table is 0.51 > 0.38; and there is a positive correlation between the condition of the family, school and community environment and learning achievement. It was shown from the calculation of the concordance coefficient 0,95 and the value of significance (p) of 0,00<0.05.

1. Introduction

Education path can build a civilization in order to educate the nation's life. Implementation of education can be realized in three forms, namely informal education that occurs in the family environment, and non-formal education that takes place in the community and formal education held in schools. Efforts made to determine whether learners have succeeded in learning by looking at students' learning achievement. A learner can be regarded as successful if they are able to complete the educational program on time with good learning achievement (Purnaningtias & Suharto, 2010).

According to Slavin (2009), the achievement of learning shows how far a capability or the goal of learning can be mastered by learners. Learning achievement is also depended on the motivation and learning habits of the learners (Achmad, et al., 2017). Nasution (2001) said that learning achievement is the mastery of a knowledge or skills in a particular field obtained

from the test results in the form of numbers. This is also confirmed by Picauly and Toy (2013) that the learning achievement is the result of the assessment of learning activities that have been done which can be a number, symbols, and letters. Students who are ready to learn will affect their own learning achievement (Mulyani, 2013). Achievement can also show the success rate of learners after following the lesson (Syarif, 2012).

Each learner basically has a desire to succeed in the learning process. In other words, learners have a desire to achieve good learning achievement. But not infrequently, learners face many challenges in the success of learning. Therefore, to achieve high learning achievement, it is necessary to trace the various factors which affect it. Learning achievement is influenced by two factors: internal factors (factors that come from within the learners), and external factors (from outside of the students themselves). Internal factors include: physiological factors ie physical condition and condition of the five senses. Psychological factors are talent, attitude, interest, intelligence, motivation and cognitive ability. The external factors that influence the students' learning achievement are the condition of the family and the condition of the school environment including facilities and infrastructure (Stevani, 2017). Widyaningsih and Yusuf (2015b) stated that student learning achievement can increase with high motivation students. As inserted by Maslihah (2011), things that are included in external factors are school environment, family and situational factor. Anggraeni and Harnanik (2015) stated that external factors are not fixed and may vary according to the environment. The above factors simultaneously affect students' achievement (Emda, 2011).

SMA Negeri 1 Manokwari is one of the formal educational institutions located in Manokwari. SMA Negeri 1 Manokwari always pay attention to family factor, and social environment in order to consider the acceptance of learners and carry out the learning process. Students in SMA Negeri 1 Manokwari have a diversity of family background and social environment. Almost every learner has different family background and social environment, so the teacher has difficulty in conducting the learning instruction.

Physics as a part of science is a discipline that studies nature, phenomena of nature, and the interactions that exist within it. Suparno (2007) stated that physics is physical knowledge, so to learn, it needs a direct experiment, because physics is a science that requires understanding; not just remembering. In order to master physics properly, learners must be active in the learning process (Chodijah, et al., 2012). The result of an observation at SMA Negeri 1 Manokwari showed that the average achievement of physics learners is under Minimum

Criterion, which is 2.67. The score is under the minimum criterion because of the environmental factors of learners who are less supportive of the learning process. Family environmental factors have a very important role in improving learners' learning achievement.

The family is the first education where children get first educational guidance about ethics and religious knowledge. Education in the family includes parenting and school environment influence on learners motivation (Harianti & Amin, 2016). Learners' activities greatly affect the success of the learners (Yusuf & Subaer, 2013). Schools play a role as a determinant of the success of learners because the schools are where students learn various activities to gain knowledge. Similarly, the community environment also influences learners because they more interact with the surrounding environment.

Based on the description above, this study aims to find out whether there is 1) correlation between family condition and learning achievement, 2) correlation between school condition and learning achievement, 3) correlation between the community environment and learning achievement, and 4) correlation between family condition, school and the community environment and learning achievement.

2. Method
2.1. Research Design

This type of research is a quantitative research. Quantitative associative research is conducted to examine how much the dependent variable changes to the influence of independent variables. The independent variables in this research are family, school and society, while the dependent variable is learning achievement.

2.2 Research Setting

The research was conducted at grade X MIA SMA Negeri Manokwari in academic year of 2014/2015

2.3 Subject of the Research

The subjects of the research are students of grade X MIA SMA Negeri Manokwari in the academic year of 2014/2015

2.4 Research Procedure

The preliminary procedure conducted in this research is by making a questionnaire of family condition, the school condition, and the community environment of learners. Before the questionnaire is used, it was first validated by the expert. Then, the data obtained is analyzed using the validity of the content of CVR (Content Validity Ratio) and CVI (Content Validity Index) as in equation (1) and (2). (Lawshe, 1975).

$$\text{CVR} = \frac{n_e - \frac{N}{2}}{\frac{N}{2}} \tag{1}$$

Notes:

N_e : Number of validator with essential score (good or very good)

N   : Number of validator

$$\text{CVI} = \frac{CVR}{\sum n} \tag{2}$$

Notes:

n   : Number of an item from each aspect

CVR   : The result of *Content Validity Ratio*

The assessment is valid if CVR or CVI in the range of 0 s.d 1. If the statement is valid, reliability analysis is done using equation (3) (Sugiyono, 2014):

$$r_{11} = \left(\frac{k}{k-1}\right)\left(1 - \frac{\sum \sigma_b^2}{\sum \sigma_t^2}\right) \tag{3}$$

Notes:

R_{11} : Instrument reliability

k   : Number of question

$\sum \sigma_b^2$: Total of item variance

$\sum \sigma_t^2$: Total of variance

Instruments are reliable if the reliability of the count is greater than the reliability of the table. Normality test using *kolmogorov smirnov* test to see the distribution of variable data, then hypothesis test is done using rank spearman correlation test and kendall's test Wtest to know the relation of independent variable to a dependent variable by using software SPSS version 22.

2.5 Data, Instrument, and Technique of Data Collection

Data collection techniques used in the research is documentation and questionnaires. Documentation is used to obtain cognitive learning achievement data of students of grade X MIA SMA Negeri 1 Manokwari at even semester in the academic year of 2014/2015. While the questionnaire method is used to obtain the data about family and the school condition, and the community environment of learners.

3. Result and Discussion

3.1 Validity of the Instruments

The results of validity indicate that all questionnaires used in the study are well validated. In this research, there are 3 validated questionnaires: family opinion questionnaire (X_1), school situation (X_2), and community environment (X_3). The researcher used CVR and CVI formulas to calculate the value given by the validator, then calculated the percentage of assessment and its reliability.

3.1.1. Questionnaire Family Circumstances. The validation sheet used to assess the family condition questionnaire (X_1) has 3 aspects and 7 assessment criteria. Assessment on each criterion is considered valid by the validator with the percentage of assessment given by the validator on the guidance aspect of 91.70%, the questionnaire scope aspect is 77.80% and the language aspect is 77.80%. Reliability obtained at 0.99 is greater than the reliability table with 5% error rate and error rate of 1% (0.99> 0.87> 0.75).

3.1.2. School Questionnaire. The validation sheet used to assess the school condition questionnaire (X_2) has 3 aspects and 7 assessment criteria. Assessment on each criterion is considered valid by the validator with the percentage of assessment given by the validator on the guidance aspect of 83.30%, the questionnaire scope aspect is 75.00%, and the language aspect is 75.00%. Reliability obtained at 0.99 is greater than the reliability table with 5% error rate and error rate of 1% (0.99> 0.87> 0.75).

3.1.3. Public Questionnaire Society. The validation sheet used to assess the community environmental questionnaire (X_3) has 3 aspects and 7 assessment criteria. Assessment on each criterion is considered valid by the validator with the percentage of assessment given by the validator on the guidance aspect of 83.30%, the questionnaire scope aspect is 77.80%, and the

language aspect is 77.80%. Reliability obtained at 0.99 is greater than the reliability table with 5% error rate and error rate of 1% (0.99> 0.87> 0.75).

3.2 Normality Test

Normality test in this research is conducted using *kolmogorov-smirnov* test. Analysis results using SPSS software version 22, with the results of the normality test can be seen in Table 1.

Table 1. The Result of Normality Test

		Family Condition	School Condition	Society Environment	Learning Achievement
N		27	27	27	27
Normal Parameter	Mean	59,07	52,67	44,81	2,80
	Deviation standard	5,24	4,59	3,85	0,10
Signification		0,20	0,19	0,20	0,00

Table 1 shows that the significance value (p) of the family condition (X_1) is 0.20 is greater than $\alpha = 0.05$ (0.20> 0.05), the significance value (p) of the school condition (X_2) is 0.18 greater than $\alpha = 0,05$ (0,18> 0,05) and society environment (X_3) equal to 0,20 bigger than $\alpha = 0,05$ (0,20> 0,05). It means that family condition data (X_1), the school condition (X_2) and community environment (X_3) of students are normally distributed. While the value of significance (p) learning achievement data (Y) of students is 0.00 is less than $\alpha = 0.05$ (0.00 <0.05) which means that the learning achievement data (Y) learners are not normally distributed.

3.3 Hypothesis Test

The results of normality data test of family condition (X_1), school condition (X_2), community environment (X_3) and learning achievement (Y) there are data of abnormally distributed variable that is variable of learning achievement data (Y), then in doing hypothesis test using non-parametric statistical analysis.

3.3.1. Correlation between Family Condition (X_1) and Learning Achievement (Y). The first hypothesis test was to find out the existence of positive and significant correlation between family condition (X_1) and (Y) learning achievement of cognitive physics of students of grade X MIA SMA Negeri 1 Manokwari at even semester in the academic year of 2014 / 2015. The results of correlation using SPSS program version 22 are shown in Table 2.

Table 2 shows the correlation coefficient between family (X_1) and learning achievement (Y) of 0,51. The strength of the correlation between the two variables is positive. Sig value. (p) = 0,01 <0,05 which means that Ho is refused and Ha is accepted. Hence, there is a significant relationship between the condition of the family and learning achievement. The calculation of coefficient of determination to see the influence of family condition on the learning achievement obtained 26.01%. Family condition affects the students' learning achievement of 26.01%, while 73.99% are influenced by other factors.

Table 2. The Result of correlation analysis of family condition and the students' learning achievement

		Family Condition	Learning Achievement
Family Condition	Correlation Coefficient	1,00	0,51
	Significance		0,01
	N	27	27
Learning Achievement	Correlation Coefficient	0,51	1,00
	Significance	0,01	
	N	27	27

The result of the analysis of the family condition variable (X_1) on (Y) the learning achievement of cognitive physics obtained the value of rs count = 0.51> rs Table = 0.38 and significance value (p) = 0.01 <α = 0.05 which explains that family condition (X_1) has a positive and significant correlation on (Y) students' learning achievement of grade X MIA SMA Negeri 1 Manokwari at even semester in the academic year of 2014/2015. This is in line with Handayani, et al. (2017) who found that family factors have a very important role in the success of learners. Parents have a very big role to make children learn at home so that the child's achievement will be good (Umar, 2015). Level of income, parent education, parents' attention and harmony among parents play a big role in learning achievement of children (Saleh, 2014). Furthermore, Parjiyono (2008) in his research stated that variant of learning achievement variables influenced by family factor variable equal to 26.90%.

3.1.1.2 Correlation between School Condition (X_2) and Learning Achievement (Y). The second hypothesis test was to know whether there is a positive and significant correlation between school conditions (X_2) and (Y) learning achievement of cognitive physics of students of grade X MIA SMA Negeri 1 Manokwari at even semester in the academic year of 2014/2015. The correlation result using SPSS program version 22 is shown in Table 3.

Table 3. The result of correlation analysis between school condition and learning achievement

		School Condition	Learning Achievement
School Condition	Correlation Coefficient	1,00	0,39
	Significance		0,04
	N	27	27
Learning Achievement	Correlation Coefficient	0,39	1,00
	Significance	0,04	
	N	27	27

Table 3 shows the correlation coefficient value between the school condition (X_2) and the learning achievement (Y) of 0.39. The strength of the correlation between the two variables is positive. Sig value. (p) = 0.04 <0.05 which means that Ho is rejected and Ha is accepted. Hence, the correlation between school conditions (X_2) and learning achievement (Y) is significant. Calculation of coefficient of determination to see the effect of school conditions on learning achievement obtained 15.60%. School conditions affect the learning achievement of learners by 15.60%, while 84.4% are influenced by other factors.

The result of the analysis of school condition variable (X_2) on (Y) learning achievement of cognitive physics obtained rs value = 0.39> rs Table = 0.38 and significance value (p) = 0.04 <α = 0.05 which explains that school condition (X_2) has a positive and significant correlation on (Y) learning achievement of cognitive physics of students of grade X MIA SMA Negeri 1 Manokwari at even semester in the academic year of 2014/2015. Priatini, et al. (2008) said that a good relationship between teachers and learners in the school environment will make participants motivated in both learning and achievement. This is in line with Watoyo (2008) in his research who concluded that the learning environment including the school environment of learners affect student achievement of 42.00%. In addition, Rerung, et al. (2017) stated that learning related to the surrounding environment such as the application of Problem Based Learning (PBL) can improve students' learning achievement. Furthermore, Pangkali, et al. (2016) stated that the activity and learners' learning achievement is determined by the facilities and infrastructure facilities of the school. Hamka and Hartono (2012) added that the learning achievement is also determined by the provision of scholarships to students. Learners who receive scholarships, are more likely to have good performance.

3.1.1.3 Correlation between Society Environment (X_3) and Learning Achievement (Y) .
The third hypothesis test was to know the existence of positive and significant correlation between society environment (X_3) and (Y) learning achievement of cognitive physics of students of grade X MIA 1 SMA Negeri 1 Manokwari at semester in the academic year of 2014/2015. The result of correlation using SPSS program version 22 is shown in Table 4.

Table 4 shows the correlation coefficient between community environment (X_3) and learning achievement (Y) of 0.51. The strength of the correlation between the two variables is positive. Sig value. (p) = 0,01 <0,05 which means that H_0 is refused and Ha is accepted. Hence, the correlation between community environment (X_3) and learning achievement (Y) is significant. The calculation of coefficient of determination to see the influence of society environment on the learning achievement obtained 26.32%. Community environment affects student learning achievement of 26.32%, while 73.68% are influenced by other factors.

Table 4. The result of correlation analysis between society environment and learning achievement

		Society Environment	Learning Achievement
Society Environment	Correlation Coefficient	1,00	0,51
	Significance		0,01
	N	27	27
Learning Achievement	Correlation Coefficient	0,51	1,00
	Significance	0,01	
	N	27	27

The analysis result of society environment variable (X_3) on (Y) learning achievement of cognitive physics obtained rs value = 0.51> rs Table = 0.38 and significance value (p) = 0.01 <α = 0,05 which explains that community environment (X_3) has a positive and significant correlation on (Y) learning achievement of cognitive physics of learners at Grade X MIA SMA Negeri 1 Manokwari at even semester in the academic year of 2014/2015. This is in line with Watoyo (2008) in his research who concluded that the learning environment that includes the community environment of learners affect student achievement of 42.00%. Further Parjiyono (2008) in his research concluded that the social environment of learners affects learning achievement of 33.80%. Arlianti (2016) found that learning by applying realia media related to the society environment positively affect the learners' learning achievement. In addition, Chasanah, et al. (2016), Galura, et al. (2016) concluded that learning-oriented social interaction such as cooperative model STAD and TGT have a positive effect on learners' learning outcomes.

3.1.1.4 Correlation between Family Condition (X₁), School Condition (X₂) and Society Environment (X₃) and Learning Achievement (Y). The fourth hypothesis test was to know the existence of positive and significant correlation between family condition (X_1), school condition (X_2) and community environment (X_3) together towards (Y) learning achievement of cognitive physics of grade X students MIA 1 SMA Negeri 1 Manokwari at even semester in the academic year of 2014/2015. The test results of kendall's W test using SPSS program version 22 are shown in Table 5.

Table 5. The Analysis result of Non-parametric Kendall's W Test

N	27
Kendall's Coefficient Concordance	0,95
Chi-Square	77,23
Asymp. Sig.	0,00

Table 5 shows the coefficient values of Kendall between family condition (X_1), school condition (X_2) and community environment (X_3) and learning achievement (Y) of 0.95. The value of Asym. sig. (p) = 0.00 <0.05 which means that Ho is rejected and Ha is accepted. Hence, there is a significant correlation between family condition (X_1), school condition (X_2) and society environment (X_3) together towards learning achievement (Y)

Family condition (X_1), school condition (X_2) and society environment (X_3) together proved to have positive and significant correlation on students' physics cognitive learning achievement (Y) of grade X MIA SMA Negeri 1 Manokwari at even semester in the academic year of 2014 / 2015. This is shown from the analysis using Kendall's W test with a significance value of 0.00. This value is smaller than α 0,05 (0,00 <0,05) which means that variables have a correlation between family condition (X_1), school condition (X_2), society environment (X_3) and learning achievement (Y) of the learners. This is in line with Parjiyono (2008) in his research who says that family factors and social environment correlate collectively to the learning achievement of learners of 0.78. Furthermore, Widyaningsih and Yusuf (2015a) concluded that the values built into the family and learning environment are very influential on the success of learners.

4. Conclusion

The family condition, school and community environment have a positive correlation to students' cognitive physics learning achievement. Correlation for the three independent variables on the dependent variable is 0.95 with the significance value (p) of 0.00 so that the

three independent variables have a significant correlation to the dependent variable. Based on these conclusions, it can be recommended that the learning achievement of learners is largely determined by condition of family, school, and community environment. Therefore, it is important for us to be able to create a comfortable atmosphere for learners in the family environment, school and in the environment where learners interact with the community.

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