

# Correlation of Parents' Education Level and Learning Independence Towards Mathematics Learning Outcomes

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## Abstract:

This study aims to determine: (1) the relationship between parental education level and mathematics learning outcomes for grade XI of SMA Swasta Teladan Pematangsiantar in academic year of 2020/2021. (2) the relationship between student learning independence and mathematics learning outcomes for grade XI of SMA Swasta Teladan Pematangsiantar in academic year of 2020/2021. (3) the relationship between parental education level and learning independence on mathematics learning outcomes for grade XI of SMA Swasta Teladan Pematangsiantar in academic year of 2020/2021. This type of research is quantitative research. The population in this study amounted to 170 students and a sample of 34 students. The data analysis used in this research is descriptive analysis, simple correlation and multiple correlation. The results of this study indicate that: (1) there is a positive and significant relationship between the level of parental education on the mathematics learning outcomes of grade XI of SMA Swasta Teladan Pematangsiantar in academic year of 2020/2021. This is indicated by the value of the correlation coefficient  $r_{x1y} = 0.714 > r_{table} = 0.339$ , and the results of the t-test  $5.771 > t_{table} 2.039$ ; (2) there is a positive and significant relationship between student learning independence and mathematics learning outcomes for grade XI of SMA Swasta Teladan Pematangsiantar in academic year of 2020/2021. This is indicated by the value of the correlation coefficient  $r_{x2y} = 0.968 > r_{table} = 0.339$  and the results of the t-test  $21.967 > t_{table} 2.039$ ; (3) there is a positive and significant relationship between the level of parental education and student learning independence together with the mathematics learning outcomes of grade XI of SMA Swasta Teladan Pematangsiantar in academic year of 2020/2021. This is indicated by the Pearson coefficient  $r_{x1x2y} = 0.968 > r_{table} = 0.339$ ; and  $F_{count} 232.39 > F_{table} 3.39$ .

## Keywords:

Parental Education Level, Independent Learning, Mathematics Learning Outcomes

## 1. Introduction

Mathematics as a universal science has an important role in various disciplines and advances one's thinking power and foundation for reasoning. The National Research Council [16] states that for a country, mathematics will prepare its citizens to compete and compete in the field of economy and technology. Mathematics is also a basic science that every student must develop and learn. Thus, mathematics must be taught to students at every level of education starting from elementary school to college. Learning mathematics requires students' readiness both from the environment and from within themselves, this is because mathematics is a lesson that is systematically structured and requires logical reasoning, so if the learning process of mathematics is not supported by two influential factors, it will certainly give obstacles when learning mathematics. The success or failure of the mathematics teaching and learning process can be measured through students' mathematics learning outcomes, if students' mathematics learning outcomes tend to be good, of course it gives an understanding that the teaching and learning process has been going well, and vice versa, if students' mathematics learning outcomes tend to be poor, of course the teaching and learning process has experienced constraint.

The results of reports from several institutions show that the development of education in Indonesia is still low. It is evident from the results of the 2015 TIMSS (Trends International Mathematics And Science Study), showing that students' ability in mathematics is in position 44 out of 49 participating countries with an average achieved of 397. In addition, the results of the Program for International Student Assessment (PISA) research) in 2018 showed that students' ability in mathematics was in position 73 of the 79 participating countries with an average achievement level of 379. Based on these data, education in Indonesia, especially in mathematics, still has lower quality compared to other countries. Student success in learning can be influenced by student learning factors, namely external factors and internal factors. One of the external factors that affect student learning outcomes is the family which is the child's first environment, so that the child gets various grades for the first time [8].

Hidayat [9] explains that parents have started educating their children since the child was born. Knowledge from parents can provide examples, advice, behavior, character, and habits for children. Through education that has been taken by parents, the knowledge is given to children. Filiani [7] explains that the level of formal education of parents is the level of education that has been taken by parents through formal education in schools, namely from SD/MI, SMP/MTs, SMA/MA/SMK to university. The education level of parents is one of the supporting factors for the success of their children's learning. The educational background of parents with learning outcomes is very influential, namely if the parents' last education is good it will lead to good study habits and get good learning outcomes, on the contrary if the parents' last education tends to be less then they will be more indifferent and do not want to know about the problem. in schools regarding student learning outcomes that tend to be lacking [5]. From the explanation above, it can be concluded that highly educated parents have the opportunity and ability to impart the knowledge that parents have to their children. They provide great knowledge of children's development and education, and understand the needs of children.

Pullal in his research using data from 1998-2011 describes the trend of education in Eastern Zimbabwe, he stated that during this period, children whose parents were more educated continued to have better learning outcomes so that they could maintain

an increasing trend of education. One of the internal factors that influence student learning outcomes is independent learning. Independent learning is very important and must be a concern for the parties involved in the world of education. For students who are accustomed to being independent in learning when faced with a problem, they tend to be calm when working on learning tasks because they have high self-confidence so that they are not easily influenced by the opinions of others. According to Basir [4] independence is one aspect of personality that is very important for individuals. Individuals who have high independence are relatively able to face all problems because independent individuals do not depend on others, always trying to face and solve existing problems. According to Johnson [10], independent learning gives students the freedom to discover how academic life is compatible with everyday life. Students organize and adjust their actions to achieve the desired goals and make their own decisions and are responsible for their decisions. Each individual takes the initiative, without the help of others in terms of finding learning activities such as formulating learning objectives, learning resources, learning needs and controlling their own learning process.

Students whose independence is hampered by disrupting the learning process, causing low independence will show low effort in adding knowledge outside of class hours, showing lack of confidence in students in doing their assignments, the habit of cheating on assignments or cheating on exams and dependence on the presence of the teacher to study in the classroom. Low learning independence makes students less understand the material optimally. Independent learning makes students more active in learning on their own or repeating the material that has been studied so that it can affect student learning outcomes at school. Although not all students who have high independence get high learning outcomes because each student has different abilities. Different students' learning abilities can affect their learning outcomes. Low learning independence can be an obstacle for children to succeed in learning. But in reality, there are still many students who depend on the resources provided by the teacher alone. They do not have the initiative to learn even though they have textbooks or worksheets that can be studied on their own outside of school. And most of the students when there are assignments given by the teacher they depend on other friends and do not have the confidence to complete the tasks given by the teacher in the learning process. In addition, it can also be seen that during daily tests or semester exams they steal each other's opportunities to get answers. There are some students in the collection of assignments that are not disciplined when collecting assignments.

Aliyyah's research states that there is a significant influence between learning independence on student learning outcomes in grades IVA and IVB at SDN Pajajaran Bogor, with the results of  $t$  count  $8,306 > t$  table  $2,000$  and a significance value of  $0.000 < 0.05$ .

## 2. Mathematics Learning Outcomes

According to Ruseffendi [15] "Learning mathematics is learning concepts starting from real, concrete objects intuitively, then at higher stages the concept is taught again in a more abstract form using the notation that is more commonly used in mathematics". Based on the above study, it can be concluded that mathematics learning outcomes are abilities obtained by students after receiving the mathematics learning process which is seen in grades. Students' mathematics learning outcomes are expressed by monthly report cards.

## ***2.1. Understanding Parents' Education Level***

After knowing about the level of education, the education level of the people in this study is the level of final education owned by the parents, whether the education level is Elementary School (SD), Junior High School (SMP), High School (SMA) and Higher Education. Higher education is a level of education after secondary education which includes diploma, bachelor, master, specialist, and doctoral education programs organized by higher education. Higher education can take the form of academies, polytechnics, high schools, institutes, or universities (Law No. 20 of 2003 Articles 19 and 20 concerning the National Education System).

In this study, parental education level is the level of formal education according to the level of education that has been taken, through formal education in tiered schools from the lowest level to the highest level, namely from elementary, junior high, high school to university.

## ***2.2. Definition of Independent Learning***

According Purwandari [13], independent is an attitude that is not dependent on the other and persistent in looking for a way out of the problems faced. Independence needs to be trained through an attitude of working hard, being tough, and willing to keep learning. Asrori [3] explains that independence is an individual's internal strength obtained through the individualization process, namely the process of self-realization and the process towards perfection. Healthy and integrated independence will be obtained through the process of diversification, development, and expression of personality to the highest level.

Mujiman [12] explains that independent learning is an active learning activity that is driven by a motive to master competence with the knowledge that has been possessed. Determination of competence as a learning goal and how to achieve it is done by the students themselves. This is related to the determination of learning time, place of study, learning rhythm, learning tempo, learning method, learning resources, and evaluation of learning outcomes. Desmita [6] defines that independence as a process for identity themselves, namely progress towards individuality which stands alone with a way to break away from parents. Furthermore, Fatimah states that independence is the attitude of individuals who will continue to learn to be independent in dealing with various environmental conditions, so that they are able to think and act on their own with an attitude that is obtained from everything that has been accumulated during development.

The researcher concludes that learning independence is the ability of students to carry out their duties in the learning process with their own awareness or without coercion from others, have confidence in their abilities, and take responsibility.

## **3. Research Methods**

### ***3.1. Types of Research***

This research is included in correlation research. Arikunto [2] says that correlation research is research conducted by researchers to determine the level of relationship between two or more variables, without making changes, additions or manipulations to data that already exists. In this study there are three variables, namely the level of parental education, independent learning and student learning outcomes in mathematics.

### **3.2. Population and Research Sample**

The population in this study were all grade XI of SMA Swasta Teladan Pematangsiantar in academic year of 2020/2021, totaling 170 students. With various considerations, this study took a sample of 20% of the total population of 170 students, so the sample used was 34 students of class XI MIPA-3 SMA Swasta Teladan Pematangsiantar as the sample in this study.

### **3.3. Research Variable**

This study consists of independent variables and dependent variables where there are two independent or independent variables, namely the influencing variable (X) and one dependent variable, namely the affected variable (Y). In this study, which is the independent variable is the level of parental education ( $X_1$ ) and independent learning ( $X_2$ ). The dependent variable in this study is the students' mathematics learning outcomes (Y).

### **3.4. Data Collection Technique**

Data collection techniques used questionnaires and documentation. Questionnaire on the level of parental education and learning independence, the variable level of parental education consists of 2 statements and the variable for learning independence consists of 37 statements used in the study. As for the variables of mathematics learning outcomes will be obtained from the documentation.

## **4. Results and Discussion**

### **4.1. The Relationship between Parents' Education Level ( $X_1$ ) on Mathematics Learning Outcomes (Y)**

The results of the analysis show that there is a positive and significant relationship between the level of parental education and the mathematics learning outcomes of students in class XI MIPA 3 SMA Swasta Teladan Pematangsiantar in academic year of 2020/2021, meaning that the higher the level of parental education of students in class XI MIPA 3 SMA Swasta Teladan Pematangsiantar in academic year of 2020/2021, the higher the level of parental education. students' mathematics learning outcomes are also high, and vice versa, the lower the parental education level of students in class XI MIPA 3 SMA Swasta Teladan Pematangsiantar, the lower the students' mathematics learning outcomes. This is evidenced from the calculation of the product *moment* correlation formula with the results of  $r_{\text{arithmetic}} r_{\text{table}}$ , which is at a low level of relationship.

### **4.2. The Relationship of Learning Independence ( $X_2$ ) to Mathematics Learning Outcomes (Y)**

The results of the analysis show that there is a positive and significant relationship between learning independence and students' mathematics learning outcomes in class XI MIPA 3 SMA Swasta Teladan Pematangsiantar in academic year of 2020/2021, meaning that the higher the learning independence received by students of class XI MIPA 3 SMA Swasta Teladan Pematangsiantar in academic year of 2020/2021, the higher it is. Students' mathematics learning outcomes, and vice versa, the lower the learning independence received by the students of class XI MIPA 3 SMA Swasta Teladan Pematangsiantar, the lower the students' mathematics learning outcomes.

This is evidenced from the calculation of the product *moment* correlation formula with the results of the  $r_{\text{count}} > r_{\text{table}}$ , which is at the moderate level of relationship. So it can be stated that the results of testing the first hypothesis  $H_0$  is rejected and  $H_a$  accepted.

#### **4.3. The Relationship between Parents' Education Level ( $X_1$ ) and Learning Independence ( $X_2$ ) on Mathematics Learning Outcomes ( $Y$ )**

The results of the analysis show that there is a positive and significant relationship between the level of parental education and learning independence on students' mathematics learning outcomes in class XI MIPA 3 SMA Swasta Teladan Pematangsiantar in academic year of 2020/2021, meaning that the higher the level of parental education and learning independence in class XI MIPA 3 SMA Swasta Teladan Pematangsiantar, the higher the students' mathematics learning outcomes, and vice versa, the lower the level of parental education and independent learning in class XI MIPA 3 SMA Swasta Teladan Pematangsiantar, the lower the students' mathematics learning outcomes. This is evidenced by the value of  $r_{\text{arithmetic}} > r_{\text{table}}$ , that is, it can be stated that the results of testing the third hypothesis  $H_0$  are rejected and  $H_a$  is accepted.

### **5. Conclusions**

Based on the results of data analysis and hypothesis testing, the researchers put forward the following conclusions:

a. There is a positive and significant relationship between the level of parental education and learning outcomes in mathematics in grade XI of SMA Swasta Teladan Pematangsiantar in academic year of 2020/2021. This is indicated by the obtained correlation value of  $0.718 > 0.339$  with a  $t_{\text{count}}$  value of  $5.771 > t_{\text{table}} 2.039$ .

b. There is a positive and significant relationship between learning independence and mathematics learning outcomes at grade XI of SMA Swasta Teladan Pematangsiantar in academic year of 2020/2021. This is indicated by the obtained correlation value of  $0.968 > 0.339$  with a  $t_{\text{count}}$  value of  $21.967 > t_{\text{table}} 2.039$ .

c. There is a jointly positive and significant relationship between the level of parental education and learning independence on mathematics learning outcomes at grade XI of SMA Swasta Teladan Pematangsiantar in academic year of 2020/2021. This is indicated by the calculated F value  $232.39 > F_{\text{table}} 3.39$  and the relationship between parental education level and learning independence on mathematics learning outcomes is included in the category of moderate relationship.

### **Conflicts of Interest**

The authors declare that there is no conflict of interest regarding the publication of this article.

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