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**Live with Nature Harmoniously Based on People's Locus of Control and  
Naturalistic Intelligence**

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Korelasi, Tanjung Priok

**ABSTRAK**

Kerusakan lingkungan disebabkan oleh campur tangan masyarakat terhadap alam. Diasumsikan bahwa kepribadian dan kecerdasan orang mempengaruhi ekosistem. Penelitian ini bertujuan mengetahui hubungan antara locus of control (LOC) dan kecerdasan naturalistik (NI) dengan perilaku bijak terhadap lingkungan (CB). Metode survei dilakukan dengan melibatkan 80 orang sebagai sampel. Ada tiga instrumen yaitu mengukur LOC, NI, dan CB masyarakat, yang sudah tervalidasi. Analisis regresi dan korelasional digunakan untuk memverifikasi hubungannya. Hasil penelitian menunjukkan bahwa ada hubungan yang positif dan signifikan antara LOC dengan CB, NI, dan CB, akhirnya antara LOC dan NI dengan CB. Regresi dan korelasi ganda digunakan untuk memprediksi CB masyarakat dalam hal bagaimana manusia hidup dengan harmonis berdasarkan LOC dan NI masyarakat. Dapat disimpulkan bahwa dalam meningkatkan CB masyarakat, LOC dan NI masyarakat tidak dapat diabaikan. Implikasinya bahwa LOC dan NI merupakan salah satu bagian penting untuk meningkatkan perilaku bijak terhadap lingkungan dalam masyarakat terkait dengan LOC dan NI setiap individu.

**ABSTRACT**

*Environmental damage is caused by people interference with nature. It has been assumed that people's personalities and intelligence influence the ecosystem. Research aims to find out the relationship between locus of control (LOC) and naturalistic intelligence (NI) with people's citizenship behavior (CB). A survey method has been applied by involving 80 people as a sample. Three instruments for measuring LOC, NI, and people's CB. Regression and correlational analysis used to verify its relationship. Research results reveal that there is a positive and significant correlation between LOC and CB, NI, and CB, finally between LOC and NI with CB. Multiple regression and correlation used to predict people's CB in terms of how people live with nature harmoniously based on people's LOC and NI. The implications that LOC and NI is one part to improve wise behavior towards the environment in society is related to the LOC and NI of each individual.*

**Keywords:**

*Citizenship Behavior, Locus of Control, Naturalistic Intelligence, Correlation Study, Tanjung Priok*

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## **INTRODUCTION**

The current of globalization, modernism, and technological development and the high intention of human activities on earth have caused many destructive impacts on the network of human life and ecosystems. UNESCO (2001) launched education for a sustainable future (education for sustainable development) at the World Summit in Johannesburg. The aim is "to empower people with the perspectives, knowledge, and skills for helping them live in peaceful sustainable societies". To empower people with perspective, knowledge, and skills to help them live in a peaceful sustainable society (Arthur, et al., 2008).

The public is often faced with the facts of the problems in their environment but not many understand the causes of environmental problems and how to react to them. Environmental problems such as floods, forest fires, mounting rubbish, dirty environments and disease outbreaks that they often see or even experience, are sometimes only considered as natural events that occur and are not felt as problems by the community itself. Efforts to foster wise behavior towards the environment (citizenship behavior).

Locus of control in the book *Modern Organization Theory and Practice* (Farazmand, 2002) is explained:

*“Rotter posited that locus of control has two dimensions. Internal locus of control suggest that people belief reinforcement are dependent on their actions; consequently, people are able to shape their existence and future. External locus of control suggest that people believe reinforcement are independent of their actions, thus, their future are determined more by chance than direct personal interventions”.*

Can be translated that locus of control has two dimensions. Internal locus of control states that people believe that power is tied to their actions, such as consequences, people can change their existence and future. External locus of control states that people believe that power is not tied to their actions, meaning that the future is determined more by chance than by direct influence on oneself.

So, the center of control (locus of control) is how individuals believe that power is bound to their actions, such as consequences, so whether a person can accept responsibility for his actions. Naturalist intelligence is the ability to recognize and classify various species, plants or flora, and fauna, in the environment. Biologists, nature lovers, nature explorers and others (Gardner and Hatch, 1989).

To improve wise behavior towards the environment (citizenship behavior) in this case is the locus of control and naturalist intelligence is a necessity that is owned and improved by the community in order to maintain, care for, and create preservation of the surrounding environment. Based on the above explanation, it is deemed necessary to conduct research on "citizenship behavior based on locus of control and naturalist intelligence: a correlational study of the people in Tanjung Priok Sub-District".

The formulation of the problems in this research are as follows:

1. Is there a relationship between locus of control and wise behavior on the environment (citizenship behavior)?
2. Is there a relationship between naturalist intelligence and wise behavior on the environment (citizenship behavior)?
3. Is there a relationship between locus of control and naturalist intelligence together with wise behavior towards the environment (citizenship behavior)?

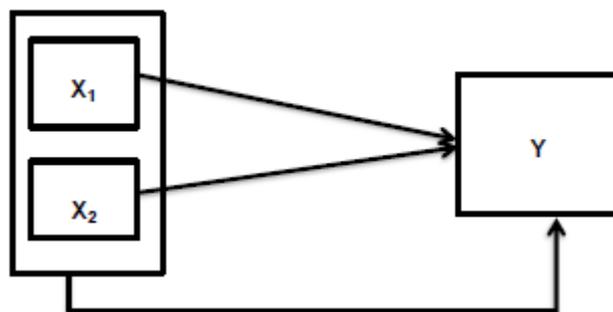
The objectives of this research are to relate the independent and dependent variables as follows:

1. Finding the relationship between locus of control and wise behavior on the environment (citizenship behavior).
2. Finding the relationship between naturalist intelligence with wise behavior on the environment (citizenship behavior).
3. Finding the relationship between locus of control and naturalist intelligence together with wise behavior towards the environment (citizenship behavior).

In accordance with the problems and objectives of the research, the hypothesis that will be tested for truth are as follows:

1. There is a positive relationship between locus of control and wise behavior on the environment (citizenship behavior).
2. There is a positive relationship between naturalist intelligence with wise behavior on the environment (citizenship behavior).
3. There is a positive relationship between locus of control and naturalist intelligence together-with wise behavior towards the environment (citizenship behavior).

So, the hypothetical model is described in Picture 1 as follows:



Picture 1. Hypothetical Model

Information: X1 = Locus of control, X2 = Naturalist intelligence, Y = Wise behavior towards the environment (citizenship behavior).

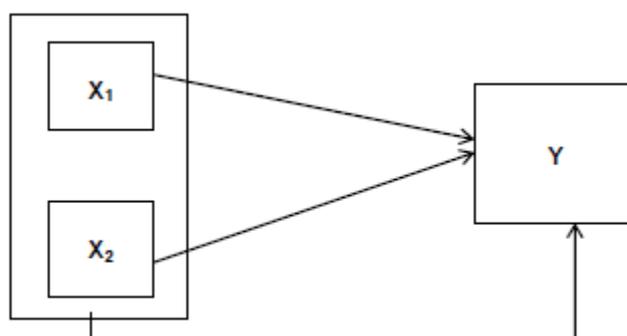
## METHODS

### Place and Time of Research

The research location is at the Tanjung Priok Sub-District, North Jakarta. When the research will be carried out in January 2016.

### Research Methods

The research was conducted using a survey method with correlational studies. This research is classified as a quantitative study using a correlational design that aims to examine the extent of the relationship between the independent variable and the dependent variable. There are three variables contained in this research, namely locus of control and naturalist intelligence as independent variables, while wise behavior on the environment (citizenship behavior) as the dependent variable. This research is intended to look at the relationship between locus of control and naturalist intelligence together with wise behavior on the environment (citizenship behavior). To further explain the variables to be studied can be seen the relationship of research variables in Picture 2 as follows:



Picture 2. Constellation of Problems

Information: Y (Dependent variable) = wise behavior towards the environment (citizenship behavior), X<sub>1</sub> (Independent variable 1)= locus of control, X<sub>2</sub> (Independent variable 2)= naturalist intelligence.

### Population and Sampling Techniques

The population of this research is all the people of Tanjung Priok Sub-District, North Jakarta. The sampling technique uses a simple random sampling area. The sample in this study is the people of Tanjung Priok Sub-District totaling 80 people (family heads and wives).

### Data Collection Techniques

To collect data in this research, researchers used a questionnaire. The questionnaire is a list of statements that will be given to research subjects. The questionnaire used aims to measure all research variables both the dependent variable and the independent variable.

### *Wise behavior towards the environment (citizenship behavior)*

Wise behavior towards the environment (citizenship behavior) in this research is behavior obtained by the community voluntarily and freely to do a job and be useful, the score obtained by the community regarding wise behavior towards the environment (citizenship behavior) is measured through a questionnaire using a Likert scale consisting of five choices answers, namely: a) always, b) often, c) sometimes, d) rarely, e) never, given for each answer in the form

of intervals starting from a score of 5-1 for answers to positive questions and vice versa in a row from score 1-5 for answers to negative questions.

The indicators on instruments of wise behavior towards the environment (citizenship behavior) include: 1) humans are seen as ecosystems, 2) exploitation of natural resources, 3) use environmentally friendly products, love the environment and face environmental issues. The instruments used to measure wise behavior towards the environment (citizenship behavior) totaled 30 questions in the questionnaire which was calculated by Pearson's product-moment correlation.

$$r_{xy} = \frac{N \sum XY - (\sum X)(\sum Y)}{\sqrt{\{N \sum X^2 - (\sum X)^2\} \{N \sum Y^2 - (\sum Y)^2\}}}$$

Information:  $r_{xy}$  = Validity coefficient, N = Number of subjects, X = Comparison value, Y = The value of the instrument to find validity.

For processing the results of the instrument trials, researchers used the help of Microsoft Office Excel 2010 with the product-moment correlation formula at a significant level  $\alpha = 0.05$  with  $n = 15$ , if  $r_{count} < r_{table}$ , then the statement is considered invalid or dropped. Meanwhile, to find out whether the instrument is reliable and can be tested, it is necessary to calculate the reliability of the question items instruments of wise behavior towards the environment (citizenship behavior) using the Cronbach Alpha coefficient formula with the help of Microsoft Office Excel 2010:

$$\alpha = \left( \frac{k}{k-1} \right) \left( 1 - \frac{\sum \sigma b^2}{(\sigma^2 t)} \right)$$

Information:  $\alpha$  = Cronbach's Coefficient Alpha or instrument reliability, k = number of fractions or many questions,  $\sum \sigma b^2$  = total of the variance of each fraction,  $\sigma^2 t$  = variant of total score.

### ***Locus of control***

The locus of control in this research is the personality of the individual in the Tanjung Priok people, where the individual nature of the Tanjung Priok people is related to the successes and failures they face when caused by oneself, the nature of a person is included in the internal locus of control and when caused outside of himself, the nature of a person including an external locus of control, with a locus of control score through items of questionnaire statements answered by the people, as measured by a scale of locus of control 2-1 to himself selects statements a or b according to his personality, statements that point to the internal are given a score of 2 and vice versa are given a score of 1 statement that leads to the external.

The indicators on instruments of locus of control include: 1) has a responsible nature to himself, 2) adjusting to oneself internally, 3) working hard of the will of oneself, 4) enthusiasm for oneself internally, 5) self-assessment of success and failure. The instrument used to measure the locus of control totaled 25 questions in the questionnaire which was calculated by Pearson product-moment correlation. For statements that lead to an internal locus of control get a score of 2, and for statements of external locus of control get a score of 1. For processing the results of the instrument trial, researcher use the help of Microsoft Office Excel 2010 with the product-

moment correlation formula at a significant level  $\alpha = 0, 05$  with  $n = 15$ , if  $r_{count} < r_{table}$ , then the statement is considered invalid or dropped.

Meanwhile, to find out whether the instrument is reliable and can be tested, it is necessary to calculate the reliability of the question items instruments of locus of control using the Kuder Richard 20 (KR-20) coefficient formula with the help of Microsoft Office Excel 2010:

$$r_{kr20} = \left( \frac{k}{k-1} \right) \left( 1 - \frac{\sum pq}{\sigma^2} \right)$$

Information:  $p$  = Respondents getting it correct/ $n$ ,  $q$  = Respondents getting it wrong/ $n$  : Or  $(1-p)$ ,  $\sum pq$  =  $pq$  summed across all items,  $\sigma^2$  = Variance for the total test scores,  $k$  = Number of items.

### ***Naturalist intelligence***

Naturalist intelligence is the ability obtained by the people of Tanjung Priok to think abstractly, adapt to new environments, learn from experience, grow crops, raise animal, plant vegetation, and have attention to environmental problems around the place of residence, with questionnaires model case examples of positive answers gets a score of 1-3 and vice versa a negative answer gets a score of 1-3.

The indicators on instruments of naturalist intelligence include: 1) recognize and classify various species of flora and fauna, 2) like outdoor activities (in nature), 3) keep the environment clean, 4) take care of the planted vegetation, 5) environmental problems around the residence. The instrument used to measure the naturalist intelligence totaled 24 questions in the questionnaire which was calculated by Pearson product-moment correlation.

For processing the results of the instrument trials, researchers used the help of Microsoft Office Excel 2010 with the product-moment correlation formula at a significant level  $\alpha = 0.05$  with  $n = 15$ , if  $r_{count} < r_{table}$ , then the statement is considered invalid or dropped. Meanwhile, to find out whether the instrument is reliable and can be tested, it is necessary to calculate the reliability of the question items instruments of naturalist intelligence using the Cronbach Alpha coefficient formula with the help of Microsoft Office Excel 2010.

### **Data Analysis Techniques**

#### ***Descriptive analysis techniques***

Descriptive analysis was conducted to look for average scores, standard deviations, frequency distribution, mode and median and histograms of wise behavior towards the environment (citizenship behavior) scores, locus of control scores and naturalist intelligence scores.

#### ***Inferential Analysis Techniques***

Inferential analysis (hypothesis testing) uses regression and correlation analysis. The data analysis requirements need to be tested first, namely the estimated error normality test and the homogeneity of variance  $Y$  over  $X$  ( $X_1$  and  $X_2$ ).

#### ***Statistical Hypothesis***

1.  $H_0 : \rho_{y1} = 0$   
 $H_1 : \rho_{y1} > 0$
2.  $H_0 : \rho_{y2} = 0$   
 $H_1 : \rho_{y2} > 0$

3.  $H_0 : \rho_{y.12} = 0$

$H_1 : \rho_{y.12} > 0$

## RESULTS AND DISCUSSION

### Data Description

The description of the data presented in this section includes the dependent variable Y, which is wise behavior towards the environment (citizenship behavior), variable X1, which is the locus of control, and variable X2, which is naturalist intelligence as an independent variable. To find a description of the data in each variable, the following descriptive statistics are displayed consisting of minimum scores, maximum scores, range, average values, modus, median, standard deviation, and variance, as summarized in the following Table 1.

Table 1. Summary of descriptive statistics of research

Description Analysis	X <sub>1</sub>	X <sub>2</sub>	Y
Number of Respondents	80	80	80
Amount	2970	2863	6148
Maximum scores	43	42	96
Minimum scores	30	29	56
Value range	13	13	40
Number of classes	7	7	7
Class length	2	2	6
Average values (Mean)	37,13	35,79	76,85
Middle values (Median)	38	36	76
Most values (Modus)	38	37	75
Standard deviation	3,57	3,37	8,74
Variance	12,6094	11,217	75,378

Descriptions of each variable are presented successively starting from the variables Y, X1, and X2.

### *Wise behavior towards the environment (citizenship behavior) variable*

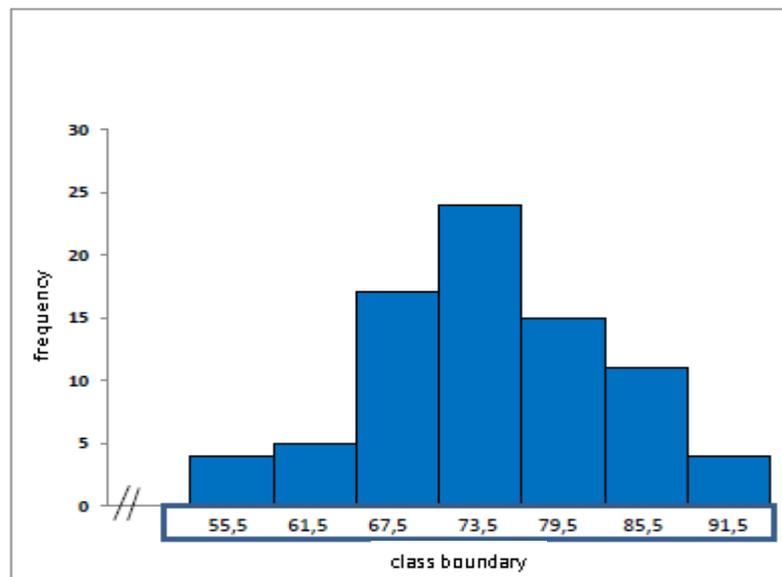
Data on wise behavior towards the environment (citizenship behavior) obtained through research instruments in the form of a questionnaire given to 80 respondents, namely the head of the family in Tanjung Priok Sub-District people, can be seen in the form of distribution in Table 2 below.

Table 2. Frequency distribution of score data on variable Y

Class	Data Interval	Lower Limit	Upper Limit	Absolute Frequency	Relative Frequency (%)
I	56-61	55,5	61,5	4	5,00
II	62-67	61,5	67,5	5	6,25
III	68-73	67,5	73,5	17	21,25
IV	74-79	73,5	79,5	24	30,00
V	80-85	79,5	85,5	15	18,75
VI	86-91	85,5	91,5	11	13,75
VII	92-97	91,5	97,5	4	5,00
<b>Total</b>				<b>80</b>	<b>100</b>

From Table 1 the range of scores is 40, the descriptive statistical calculation obtained an average score is 76,85, the standard deviation is 75,387, the modus is 75, and the median is 76. From Table 2 above, it can be seen that the data obtained from 80 Sample people can be classified into 7-grade interval scores. The minimum score obtained by the community is 56 which is included in the interval class between 56-61, the absolute frequency is 4. The same is true for the highest score with 96 that is included in the 92-97 interval class whose absolute frequency value is 4. The score that has the highest absolute frequency is in the interval class 74-79 with an absolute frequency value is 24.

Based on Table 2, a histogram can be made that illustrates the class boundary of the interval class contained in the table. The axis contained in the histogram is usually called the x-axis and the y-axis. The x-axis shows the absolute frequency value, while the y-axis shows the value of the upper-class limit on the score of wise behavior towards the environment (citizenship behavior) people. The upper and lower limits are located on each black line separating the histogram bar from one another. In the histogram image below it is known that the lower limit starts with a score of 55,5 and the upper limit can be determined by adding 6 and so on. The histogram graph of the data distribution of wise instruments of behavior towards the environment (citizenship behavior) is visualized as shown in Picture 3 below.



Picture 3. Frequency Histogram Chart for Wise Behavior Towards the Environment (Citizenship Behavior)

***Locus of control variable***

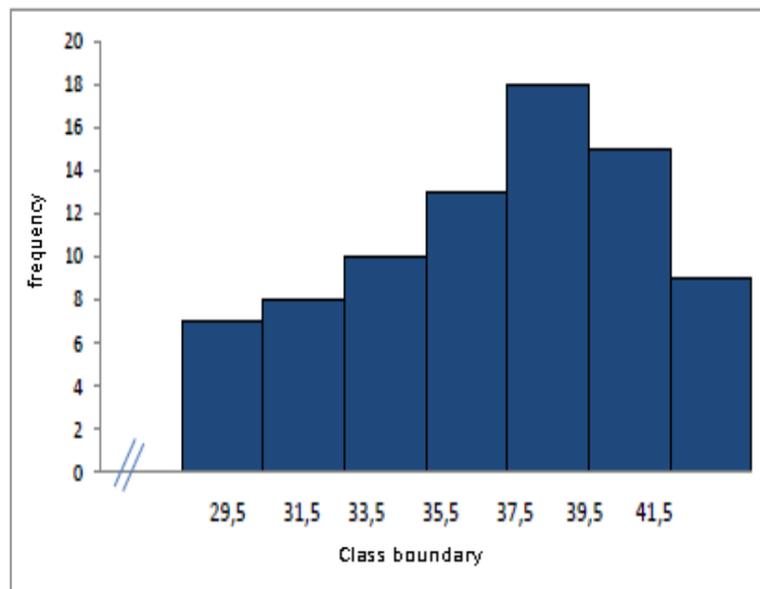
Based on the data obtained from the calculation results for the locus of control variable data is the highest value is 43 and the lowest value is 30 so the range obtained is 13. While the average value is 37,13, the median is 38, the modus is 38, the standard deviation is 3,57 and the variance is 12,6094. Furthermore, the locus of control data is presented in the form of a frequency distribution as presented in Table 3 below.

Table 3. Frequency Distribution on Variable Score  $X_1$ 

Class	Data Interval	Lower Limit	Upper Limit	Absolute Frequency	Relative Frequency (%)
I	30-31	29,5	31,5	7	8,75
II	32-33	31,5	33,5	8	10,00
III	34-35	33,5	35,5	10	12,50
IV	36-37	35,5	37,5	13	16,25
V	38-39	37,5	39,5	18	22,50
VI	40-41	39,5	41,5	15	18,75
VII	42-43	41,5	43,5	9	11,25
<b>Total</b>				<b>80</b>	<b>100</b>

From Table 3 above, it can be seen that the data obtained from 80 sample people can be classified into 7-grade interval scores. The minimum score obtained by the public is 30 which is included in the interval class between 30-31, the absolute frequency is 7. Likewise what happens in the acquisition of the highest score is 43 which is included in the interval class 42-43 whose absolute frequency value is 9. The score that has the highest absolute frequency is in the class interval 38-39 with the absolute frequency value is 18.

Based on Table 3, a histogram can be made that illustrates the class boundary of the interval class contained in the table. The axis contained in the histogram is usually called the x-axis and the y-axis. The x-axis shows the absolute frequency value, while the y-axis shows the upper-class boundary value on the locus of control score. The upper and lower limits are located on each black line separating the histogram bar from one another. In the histogram image below it is known that the lower limit starts with a score of 29,5 and the upper limit can be determined by adding 2 and so on. The histogram graph of the distribution of instrument data is visualized as shown in Picture 4 below.



Picture 4. Frequency Histogram Chart for Locus of Control

***Naturalist intelligence variable***

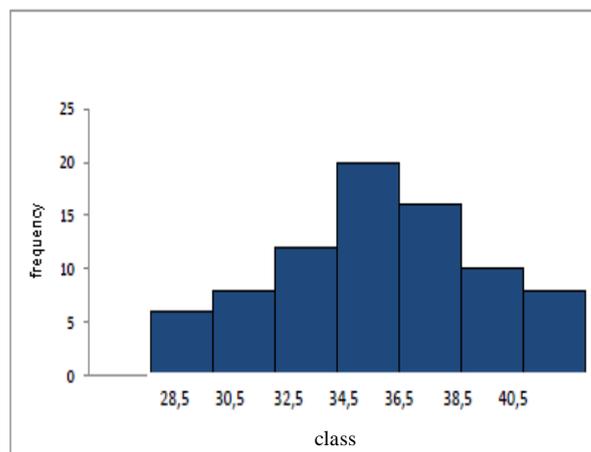
Based on data obtained from the calculation results for naturalist intelligence variable data is the highest value is 42 and the lowest value is 29 so the range obtained is 13. While the average is 35,79, the median is 36, the modus is 37, the standard deviation is 3,37 and the variance is 11,217. Furthermore, naturalist intelligence data are presented in the form of frequency distributions as presented in Table 4.

Table 4. Frequency Distribution on Variable Score X<sub>2</sub>

<b>Class</b>	<b>Data Interval</b>	<b>Lower Limit</b>	<b>Upper Limit</b>	<b>Absolute Frequency</b>	<b>Relative Frequency (%)</b>
I	29-30	28,5	30,5	6	7,50
II	31-32	30,5	32,5	8	10,00
III	33-34	32,5	34,5	12	15,00
IV	35-36	34,5	36,5	20	25,00
V	37-38	36,5	38,5	16	20,00
VI	39-40	38,5	40,5	10	12,50
VII	41-42	40,5	42,5	8	10,00
<b>Total</b>				<b>80</b>	<b>100</b>

From Table 4 above, it can be seen that the data obtained from 80 sample people can be classified into 7-grade interval scores. The minimum score obtained by the public is 29 which is included in the interval class between 29-30, the absolute frequency is 6. Likewise what happens in the highest score acquisition is 42 which is included in the interval class 41-42 whose absolute frequency value is 8. The score that has the highest absolute frequency is in the class interval 35-36 with the absolute frequency value is 20.

Based on Table 4, a histogram can be made that illustrates the class boundary of the interval class contained in the table. The axis contained in the histogram is usually called the x-axis and the y-axis. The x-axis shows the absolute frequency value, while the y-axis shows the value of the upper-class limit on the score of naturalist intelligence. The upper and lower limits are located on each black line separating the histogram bar from one another. In the histogram image below it is known that the lower limit starts with a score of 28,5 and the upper limit can be determined by adding 2 and so on. The histogram graph of the distribution of instrument data is visualized as shown in Picture 5 below.



Picture 5. Frequency Histogram Chart for Naturalist Intelligence

**Testing data analysis requirements**

Before conducting data analysis using regression and correlation analysis, certain statistical tests are performed. The statistical tests that must be met in the regression and correlation analysis include: 1) the estimated error normality test, 2) the homogeneity test and 3) the significance and linearity coefficient of the regression coefficient.

***Test the normality of estimated errors***

The first requirement used in compiling a regression model must meet the assumption that the data come from a normally distributed population. Data error normality test can be done to find out that the observed sample error distribution comes from normally distributed populations. The assumption test in this study was carried out by testing the normality of the data from the three estimated errors of the research to be analyzed.

Normality requirements testing is performed using the Liliefors test technique. The criteria for testing  $H_0$  reject states that the score is normally distributed if the  $L_{count}$  is smaller than the  $L_{table}$ , in other cases  $H_0$  cannot be accepted. From the results of the research, it can be seen that the maximum  $F(Z_i) - S(Z_i)$  concluded by  $L_{count}$  for the three error estimated regression is smaller than the  $L_{table}$  value, the rejection limit  $H_0$  is listed in the Liliefors table. The results of normality test calculations are listed in the following Table 5.

Table 5. Test Results for Regression Estimation Normality Errors

<b>Regression Estimated Error</b>	<b>n</b>	<b><math>L_{count}</math></b>	<b><math>L_{table}</math></b>	<b>Information</b>
Y over $X_1$	80	0,062	0,099	Normal
Y over $X_2$	80	0,069	0,099	Normal
$X_2$ over $X_1$	80	0,093	0,099	Normal

Based on the calculated  $L_{count}$  and  $L_{table}$  above, it can be concluded that all data pairs from variables of wise behavior towards the environment (citizenship behavior) over locus of control, wise behavior towards the environment (citizenship behavior) for naturalist intelligence, and locus of control for naturalist intelligence come from normally distributed samples.

***Homogeneity variance test***

The homogeneity variance test is intended to test the homogeneity of variance between groups of Y scores which are grouped based on the similarity of  $X_1$  values. Homogeneity testing with Bartlett test. The testing criteria are as follows:

If  $\chi^2_{count} \geq \chi^2_{table}$  reject  $H_0$  (not homogeneous)

If  $\chi^2_{count} < \chi^2_{table}$  accept  $H_0$  (homogeneous)

**Homogeneity testing of variance Y over  $X_1$** 

The results of calculations for testing the variance of wise behavior on the environment (citizenship behavior) (Y) on the locus of control ( $X_1$ ) obtained the value of  $\chi^2_{count} = 43,52 < \chi^2_{table} = 85,96$ . Thus it can be concluded that the data grouping data on wise behavior on the environment (citizenship behavior) (Y) over the locus of control ( $X_1$ ) has a homogeneous variance.

Homogeneity testing of variance Y over X2

Calculation results for testing the variance of wise behavior on the environment (citizenship behavior) (Y) on naturalist intelligence (X2) obtained value of  $x^2_{count} = 21,94 < x^2_{table} = 85,46$ . Thus it can be concluded that the data grouping data of wise behavior on the environment (citizenship behavior) (Y) over naturalist intelligence (X2) has a homogeneous variance.

Homogeneity testing of variance X2 over X1

The calculation results for testing the variance of naturalist intelligence (X2) on the locus of control (X1) obtained the value of  $x^2_{count} = 3,98 < x^2_{table} = 85,96$ . Thus it can be concluded that the naturalist intelligence (X2) grouping data over the locus of control (X1) has a homogeneous variance.

Table 6. Summary of the Homogeneity Test Results for Variance Y Over X<sub>1</sub>, Y Over X<sub>2</sub> and X<sub>2</sub> Over X<sub>1</sub>

Variable	$x^2_{count}$	$x^2_{table}$	Conclusion
Y over X <sub>1</sub>	43,52	85,96	Homogen
Y over X <sub>2</sub>	21,94	85,46	Homogen
X <sub>2</sub> over X <sub>1</sub>	3,98	85,96	Homogen

***Test of significance and regression linearity***

Research hypothesis testing is carried out using regression and correlation analysis techniques. Regression analysis is used to predict the relationship model while correlation analysis is to determine the degree of relationship between research variables. The significance and linearity testing criteria for the regression model are set as follows:

Significant regression:  $F_{count} \geq F_{table}$  in the regression line

Linear regression :  $F_{count} \leq F_{table}$  in the matching tuna line

The next stage is to conduct a correlational analysis by reviewing the level and significance of the relationship between pairs of dependent variables with independent variables. The degree of this relationship was tested using the correlation coefficient value "Product Moment Pearson (r)" and the coefficient of determination ( $r^2$ ). The high value of the two coefficients shows the high influence or correlation between the variables analyzed.

Significance test and linearity equation of regression of wise behavior to the environment (citizenship behavior) on locus of control

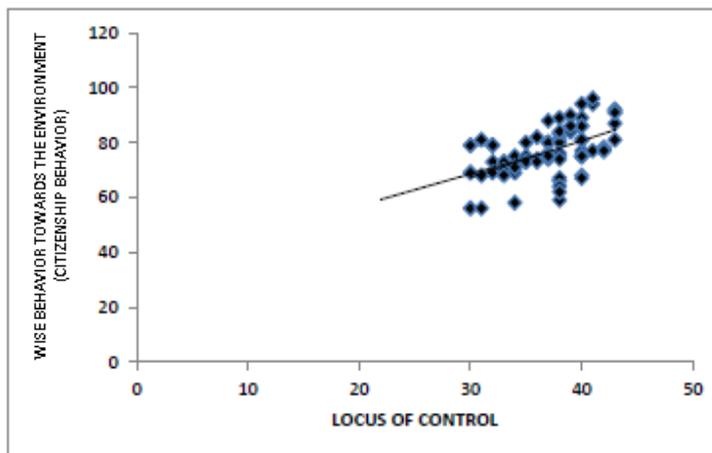
From the calculation data for the preparation of the regression equation model between wise behavior towards the environment (citizenship behavior) with the locus of control that obtained a regression constant  $a=27,44$  and a regression coefficient  $b=1,33$ . Thus the relationship of the simple regression equation model is  $\hat{Y}=27,44+1,33X_1$ . Before the regression equation model is further analyzed and used in concluding, first the significance and linearity of the regression equation are tested. The results of the calculations of significance and linearity are arranged in the ANAVA table as in Table 7.

Table 7. ANAVA for Significance and Linearity Test for Regression Equation  $\hat{Y}=27,44+1,33X_1$

Variance	JK	Dk	RJK	F <sub>count</sub>	F <sub>table</sub>	
					0,05	0,01
Total	478504,00	80				
Regression (a)	472473,80	1				
Regression (b/a)	1786,67	1	1786,67	32,84**	3,96	6,97
Remainder	4243,53	78	54,40			
Tuna Match	1027,32	66	15,57	0,06 <sup>ns</sup>	2,38	3,52
Error	3216,21	12	268,02			

Information: \*\* = significant regression ( $32,84 > 6,97$  at  $\alpha = 0,01$ ), ns = linear regression ( $0,06 < 2,38$  at  $\alpha = 0,05$ ), dk = degree of freedom, JK = sum of squares, RJK = average number of squares.

Regression equation  $\hat{Y}=27,44+1,33X_1$ , for the significance test obtained  $F_{count} = 32,84$  is greater than  $F_{table} = 6,97$  at  $\alpha = 0,01$ . Because  $F_{count} > F_{table}$ , the regression equation is stated to be very significant. For the linearity test, the  $F_{count}$  of 0,06 is smaller than the  $F_{table}$  of 2,38 at  $\alpha = 0,05$ . Because  $F_{count} < F_{table}$ , the estimated point distribution forming a linear line is acceptable. Visually it can be seen in Picture 6 below.



Picture 6. The Graph of the Regression Equation  $\hat{Y}=27,44+1,33X_1$

The correlation coefficient used is a partial correlation that is obtained by the matrix as follows:

Table 8. Correlation Coefficient Matrix

	X <sub>1</sub>	X <sub>2</sub>	Y
X <sub>1</sub>	1	0,507	0,544
X <sub>2</sub>		1	0,572
Y			1

Significance test and linearity equation of regression of wise behavior to the environment (citizenship behavior) on naturalist intelligence

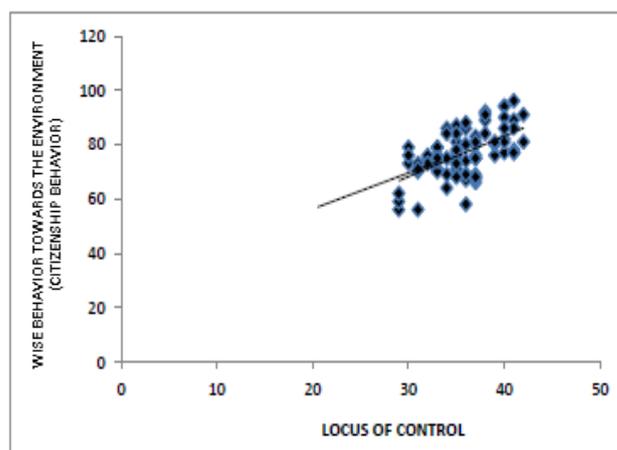
From the calculation data for the compilation of a regression equation model between wise behavior towards the environment (citizenship behavior) with the naturalist intelligence obtained a regression constant  $a=23,75$  and a regression coefficient  $b=1,48$ . Thus the relationship of the simple regression equation model is  $\hat{Y}=23,75+1,48X_2$ . Before the regression equation model is analyzed further and used in drawing conclusions, first the significance and linearity of the regression equation are tested. The results of the calculations of significance and linearity are arranged in the ANAVA table as in Table 9.

Table 9. ANAVA for Significance and Linearity Test for Regression Equation  $\hat{Y}=23,75+1,48X_2$

Variance	JK	Dk	RJK	F <sub>count</sub>	F <sub>table</sub>	
					0,05	0,01
Total	478504,00	80				
Regression (a)	472473,80	1				
Regression (b/a)	1975,47	1	1975,47	38,00**	3,96	6,97
Remainder	4054,73	78	51,98			
Tuna Match	1236,50	66	18,73	0,08 <sup>ns</sup>	2,38	3,52
Error	2818,24	12	234,85			

Information: \*\* = significant regression ( $38,00 > 6,97$  at  $\alpha = 0,01$ ), ns = linear regression ( $0,08 < 2,38$  at  $\alpha = 0,05$ ), dk = degree of freedom, JK = sum of squares, RJK = average number of squares.

Regression equation  $\hat{Y}=23,75+1,48X_2$ , for the significance test obtained  $F_{count} = 38,00$  is greater than  $F_{table} = 6,97$  at  $\alpha = 0,01$ . Because  $F_{count} > F_{table}$ , the regression equation is stated to be very significant. For the linearity test, the  $F_{count}$  of 0,08 is smaller than the  $F_{table}$  of 2,38 at  $\alpha = 0,05$ . Because  $F_{count} < F_{table}$ , the estimated point distribution forming a linear line is acceptable. Visually it can be seen in Picture 7 below.



Picture 7. The Graph of the Regression Equation  $\hat{Y}=23,75+1,48X_2$

Significance test and linearity equation of regression of locus of control on naturalist intelligence

From the calculation data for the preparation of the regression equation model between the locus of control and naturalist intelligence, the regression constant  $a=18,04$  and the regression coefficient  $b=0,48$  are obtained. Thus the relationship of the simple regression equation model is  $X_2=18,04+0,48X_1$ . Before the regression equation model is analyzed further and used in

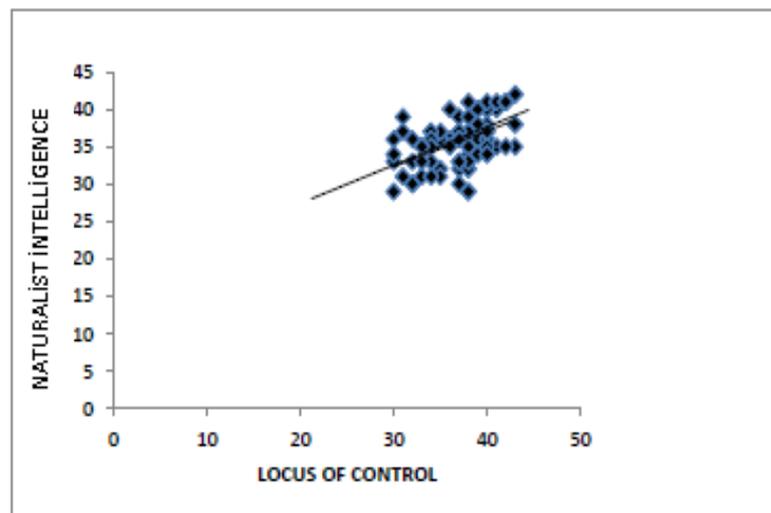
drawing conclusions, first the significance and linearity of the regression equation are tested. The results of the calculation of significance and linearity are arranged in the ANAVA table as shown in the following Table 10.

Table 10. ANAVA for Significance and Linearity Test for Regression Equation  
 $X_2=18,04+0,48X_1$

Variance	JK	Dk	RJK	F <sub>count</sub>	F <sub>table</sub>	
					0,05	0,01
Total	103357,00	80				
Regression (a)	102459,61	1				
Regression (b/a)	230,43	1	230,43	26,95**	3,96	6,97
Remainder	666,96	78	8,55			
Tuna Match	99,95	66	1,51	0,03 <sup>ns</sup>	2,38	3,52
Error	567,01	12	47,25			

Information: \*\* = significant regression ( $26,95 > 6,97$  at  $\alpha = 0,01$ ), ns = linear regression ( $0,03 < 2,38$  at  $\alpha = 0,05$ ), dk = degree of freedom, JK = sum of squares, RJK = average number of squares.

Regression equation  $X_2=18,04+0,48X_1$ , for the significance test obtained  $F_{\text{count}} = 26,95$  is greater than  $F_{\text{table}} = 6,97$  at  $\alpha = 0,01$  because  $F_{\text{count}} > F_{\text{table}}$ , the regression equation is declared very significant. For the linearity test, the  $F_{\text{count}}$  of 0,03 is smaller than the  $F_{\text{table}}$  of 2,38 at  $\alpha = 0,05$ . Because  $F_{\text{count}} < F_{\text{table}}$ , the estimated point distribution forming a linear line is acceptable. Visually it can be seen in Picture 8 below.



Picture 8. The Graph of the Regression Equation  $X_2=18,04+0,48X_1$

The overall results of the significance and linearity regression tests are summarized in the following Table 11.

Table 11. Significance Test Results and Regression Linearity Tests

Reg	Equation	Regression test		Linearity test		Conclusion
		F <sub>hitung</sub>	F <sub>tabel</sub> α=0,01	F <sub>hitung</sub>	F <sub>tabel</sub> α=0,05	
Y over X <sub>1</sub>	$\hat{Y}=27,44+1,33X_1$	32,84**	6,97	0,06 <sup>ns</sup>	2,38	Very significant/linear regression
Y over X <sub>2</sub>	$\hat{Y}=23,75+1,48X_2$	38,00**	6,97	0,08 <sup>ns</sup>	2,38	Very significant/linear regression
X <sub>2</sub> over X <sub>1</sub>	$X_2=18,04+0,48X_1$	26,95**	6,97	0,03 <sup>ns</sup>	2,38	Very significant/linear regression

Information: Reg = Regression, \*\* = Very significant, ns = Non signifikan.

One very important requirement that must be fulfilled is the existence of a significant correlation between variables related to relating to one another. The relationship that has been proven through the correlation coefficient has not concluded the occurrence of a causal relationship between these variables.

**Hypothesis test**

***The relationship between locus of control (X<sub>1</sub>) with wise behavior towards the environment (citizenship behavior) (Y)***

The first hypothesis proposed in this research is that there is a positive relationship between locus of control (X<sub>1</sub>) and wise behavior on the environment (citizenship behavior) (Y). The magnitude of the correlation coefficient between variables X<sub>1</sub> and Y can be seen in the following Table 12.

Table 12. The Relationship Between X<sub>1</sub> and Y

Relationship	n	r <sub>yx</sub>	t <sub>count</sub>	t <sub>table</sub> α = 0,05
Locus of control (X <sub>1</sub> ) with wise behavior towards the environment (citizenship behavior) (Y)	80	0,544	5,731**	1,66

Information: \*\* = The correlation was very significant (t<sub>count</sub> > t<sub>table</sub>) at α = 0,05.

From the results of calculations between the locus of control with wise behavior on the environment (citizenship behavior) indicated Product Moment correlation coefficient of r<sub>yx</sub> = 0,544 and the significance test of the correlation coefficient with t-test obtained the price of t<sub>count</sub> = 5,731 with a price of table with dk = 78 and a significant level α = 0,05 obtained the value is 1,66. Because t<sub>count</sub> = 5,731 > t<sub>table</sub> = 1,66, it can be concluded that H<sub>0</sub> is rejected. This finding concludes that there is a positive relationship between locus of control and wise behavior on the environment (citizenship behavior). In other words, the more internal locus of control, the higher the wise behavior on the environment (citizenship behavior).

*The relationship between naturalist intelligence (X<sub>2</sub>) and wise behavior towards the environment (citizenship behavior) (Y)*

The second hypothesis proposed in this research is that there is a positive relationship between naturalist intelligence (X<sub>2</sub>) and wise behavior on the environment (citizenship behavior) (Y). The magnitude of the correlation coefficient between variables X<sub>2</sub> and Y can be seen in the following Table 13.

Table 13. The Relationship Between X<sub>2</sub> and Y

Relationship	n	r <sub>yx</sub>	t <sub>count</sub>	t <sub>table</sub> α = 0,05
Naturalist intelligence (X <sub>2</sub> ) with wise behavior towards the environment (citizenship behavior) (Y)	80	0,572	6,165**	1,66

Information: \*\* = The correlation was very significant (t<sub>count</sub> > t<sub>table</sub>) at α = 0,05.

From the results of calculations between naturalist intelligence with wise behavior towards the environment (citizenship behavior) indicated by the Product Moment correlation coefficient of r<sub>yx</sub> = 0,572 and the significance test of the correlation coefficient with the t-test obtained the price of t<sub>count</sub> = 6,165 with the price of t<sub>table</sub> with dk = 78 and a significant level α = 0,05 obtained value is 1,66. Because t<sub>count</sub> = 6,165 > t<sub>table</sub> = 1,66, it can be concluded that H<sub>0</sub> is rejected. This finding concludes that there is a positive relationship between naturalist intelligence and wise behavior in the environment (citizenship behavior). In other words, the higher the naturalist intelligence, the better the wise behavior towards the environment (citizenship behavior).

*The relationship between locus of control (X<sub>1</sub>) and naturalist intelligence (X<sub>2</sub>) together with wise behavior towards the environment (citizenship behavior) (Y)*

The third hypothesis proposed in this research is that there is a positive relationship between locus of control (X<sub>1</sub>) and naturalist intelligence (X<sub>2</sub>) together with wise behavior on the environment (citizenship behavior) (Y). The magnitude of the correlation coefficient between variables X<sub>1</sub> and X<sub>2</sub> can be seen in Table 14 below.

Table 14. Results of Calculation of Significance of Multiple Regression Coefficients Positive Relationship Between Locus of Control (X<sub>1</sub>) and Naturalist Intelligence (X<sub>2</sub>) with Wise Behavior towards the Environment (Citizenship Behavior) (Y)

Variable	Regression coefficient	F <sub>count</sub>	F <sub>table</sub>	Information
Y over X <sub>1</sub> and X <sub>2</sub>	0,644	10,27	3,11	significant

From the calculation of the significance of the multiple regression coefficients in Table 14, the F<sub>count</sub> is 10,27. While based on a significant level α = 0,05, the F<sub>table</sub> is 3,11 with dk = 77, the F<sub>count</sub> value is greater than the F<sub>table</sub> value, so reject H<sub>0</sub> and accept H<sub>1</sub>. This finding concludes that there is a positive relationship between locus of control and naturalist intelligence together with wise behavior towards the environment (citizenship behavior). In other words, the more internal locus of control and the higher the naturalist intelligence, the better wise behavior towards the environment (citizenship behavior).

This research was carried out following the steps of scientific procedure and the process of analysis has been pursued thoroughly. The results obtained in this study are tested

hypotheses. Analysis of the data in the previous section, the findings can be explained there is a relationship between variables  $X_1$ ,  $X_2$ , and  $Y$  variables, as follows:

**First**, testing the first hypothesis concluded that there was a positive relationship between locus of control and wise behavior towards the environment (citizenship behavior), which indicated the  $t_{\text{count}}$  value was 5,731, greater than  $t_{\text{table}}$  is 1,66 ( $\alpha = 0,05$ ,  $dk = 78$ ). The pattern of relationships between these two variables is expressed by the regression equation  $\hat{Y} = 27,44 + 1,33X_1$ .

This is supported by Anisah's opinion (2016) which shows the relationship between locus of control and ethical behavior that the higher the locus of control of internal of an individual, the higher the individual's ethical behavior. Conversely, the higher the locus of control of external, the lower the ethical behavior. (Rotter, 1966 in Dayakisni, 2012) asserted that locus of control is a belief in which an individual has a central control in his life, both inside the individual (internal) or outside the individual (external). Individuals with a locus of control of external see themselves highly determined by how the environment and others see them. Whereas locus of control of internal sees great independence in life where life is largely determined by himself.

The concept developed by (Rotter, 1966 in Pinasti, 2011) states that each person is different in how and how much control they have over their behavior and relationships with others and the environment. According to Rotter (1966), people who have a locus of control of internal generally believe that the source of control is within themselves and they exercise personal control which is quite high in most situations (Feist & Feist, 2009). (Lefcourt in Srianik, 2008) locus of control of internal where the individual sees events in his life as a consequence of his actions thus can be controlled (internal control) or can be something that is not related to his behavior so that outside his control (external control).

**Second**, testing the second hypothesis concludes that there is a significant positive relationship between naturalist intelligence and wise behavior towards the environment (citizenship behavior), which is indicated by the  $t_{\text{count}}$  value of 6,165, greater than  $t_{\text{table}}$  is 1,66 ( $\alpha = 0,05$ ,  $dk = 78$ ). The pattern of relationships between these two variables is expressed by the regression equation  $\hat{Y} = 23,75 + 1,48X_2$ .

This is supported by the opinion of Ningtyas (2019) that naturalistic intelligence is a student's ability to recognize flora and fauna and solve environmental problems to create work that is valuable to the natural environment. In the previous theory that has been explained by Wilson (1994) that naturalistic intelligence can increase environmental concern in this case is the new environmental paradigm. As has been stated by Carson (1962) that naturalistic intelligence will increase environmental awareness while influencing pro-environment behavior.

According to previous research by Yunitasari (2018), it was found that there was a relationship between naturalistic intelligence and students' environmental insightful behavior. Except for the research results obtained by Ananda (2018) that is, there are insignificant differences in environmental sensitivity between students who have high naturalistic intelligence and students who have low naturalistic intelligence.

**Third**, testing the third hypothesis concluded that there was a significant and significant relationship between locus of control and naturalist intelligence with wise behavior towards the

environment (citizenship behavior), which indicated that the  $F_{\text{count}}$  value was 10,27 greater than  $F_{\text{table}}$  was 3,11 ( $\alpha = 0,05$ ,  $dk = 77$ ). The pattern of relationships between these two variables is expressed by the regression equation  $X_2 = 18,04 + 0,48X_1$ .

Prioritizing the development of strategic skills, locus of control, willingness to act, to achieve the behavior of citizens who behave wisely towards the environment (citizenship environment behavior) (Hungerford & Volk, 1990 in Putrawan, 2014). According to Kubas (2016), education and information are the main factors that determine the effects of environmental sensitivity. Based on the results of previous studies, environmental sensitivity can be influenced by environmental adaptation, life experience, and education information possessed by someone. So, it can be concluded that high empathy for the environment can be influenced by factors other than naturalistic intelligence.

According to Robert and Elena (2007) naturalist intelligence is the capacity to learn from experience and intelligence to adapt to the surrounding environment. Armstrong (2009) characterizes naturalist intelligence as follows: 1) familiar with pets, 2) enjoying outdoor walks or to zoos or natural history museums, 3) showing sensitivity to natural forms, 4) like gardening or being near a garden, 5) spending time near an aquarium, terrarium, or another natural life system, 6) showing ecological awareness (for example: through recycling, community service, etc.), 7) believing that animals have their rights, 8) record natural phenomena involving animals, plants, similar things (for example: having photographs, diaries, collection drawings, etc.), 9) bringing home insects, flowers, leaves or other natural objects to show to family members, 10) show a deep understanding in school on topics involving living systems (for example: biology topics in natural science subjects, environmental topics in social studies subjects, etc.).

The results of correlational analysis indicate that the hypothesis testing that has been done shows that the three hypotheses proposed in this research, are accepted or significant. The test results can be reaffirmed as follows: 1) there is a positive relationship between locus of control with wise behavior on the environment (citizenship behavior). 2) there is a positive relationship between naturalist intelligence with wise behavior on the environment (citizenship behavior). 3) there is a positive relationship between locus of control and naturalist intelligence together with wise behavior towards the environment (citizenship behavior).

## **CONCLUSION**

Data in this research using regression analysis and correlation analysis, it can be concluded the results of the research are as follows: 1) there is a positive relationship between locus of control with wise behavior on the environment (citizenship behavior). 2) there is a positive relationship between naturalist intelligence with wise behavior on the environment (citizenship behavior). And 3) there is a positive relationship between locus of control and naturalist intelligence together with wise behavior towards the environment (citizenship behavior).

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