The Relationship between Ecological Intelligence and Media Exposure with Environmentally Friendly Behaviour

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	Abstract
Keywords: Ecological Intelligence Media Exposure Environmentally Friendly Behaviour Increase in Human Resources Environmental Problem	The environment in Indonesia is one of the world's centers of biodiversity, known as a mega-biodiversity country. The high diversity does not make Indonesia contribute significantly to environmental improvement. One of the factors that causes it is human behaviour. Therefore, efforts are needed to prevent and minimize these behaviours by increasing human resources through the application of ecological intelligence and media exposure to create environmentally friendly behaviour. This research aims to measure the level of ecological intelligence, media exposure, and environmentally friendly behaviour of students and to analyze the relationship between ecological intelligence and media exposure with environmentally friendly behaviour among private junior high school students in DKI Jakarta. This research was conducted at SMP Labschool Kebayoran, SMP Istiqlal Jakarta, and SMP Laboratorium Jakarta in the odd semester of the 2020/2021 academic year. The method used is quantitative through correlational studies. Sampling was done by cluster random sampling and obtained 90 students. Data collection was carried out using ecological intelligence instruments, media exposure, and environmentally friendly behaviour, then analyzed by normality and homogeneity tests. The results show us that media exposure contributes more than ecological intelligence to form environmentally friendly behaviour.

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Introduction

The environment in Indonesia is one of the world's centers of biodiversity, second ranked after Brazil, and known as a mega-biodiversity country (Triyono, 2013) which means that there are many genetic uniqueness, high diversity of species, ecosystems, and endemism (Sutoyo, 2010) which should have vital and strategic benefits needed both now and in the future (Suhartini, 2009). Unfortunately, high biodiversity is not compatible with high efforts to conserve it. This makes Indonesia sixth ranked with the most extinctions of biodiversity in the world (Pranita, 2019).

On a global scale, the crises that hit the world mostly originate from environmental problems (Sachs, 2009), including global warming, depletion of the ozone layer (Kılınç, 2010), species extinction, and various other forms of damage that all threaten life sustainability (Saribas et al., 2014) which stole the world's attention from the 1970s to the present (Mayank et al., 2013). This is due to technological developments, globalization, and the increasing human need for the environment (Kılınç, 2010).

The environment is a system that cannot be separated in human life, where there is a reciprocal relationship between the environment and living things. In Law Number 23 of 1997 Article 1, the environment is defined as a spatial unit with all objects, forces, conditions, and living things, including humans and their behaviour that affect the continuity of life and the welfare of humans and other living creatures (Pemerintah Republik Indonesia, 1997). The fundamental cause of these environmental problems comes from human behaviour (Vlek & Steg, 2007) in line with the opinion that the cause of environmental damage that occurs is the collective impact of human behaviour itself (Clayton & Brooke, 2005). Environmental problems occur due to two factors, namely natural factors and human factors. Environmental damage due to natural factors, namely natural events that have an impact on environmental damage, among others: forest fires, volcanic eruptions, earthquakes, hurricanes, floods, and so on. Meanwhile, due to human factors, namely human behaviour or actions that have an impact on environmental damage, among others; forest burning, pollution due to garbage and waste, hunting of animals, and so on (Christie, 2013). Therefore, in Indonesia the human factor is the biggest factor that contributes to natural disasters (Sartohadi & Suyono, 2003).

According to Chiras, Daniel D. 1991, in Masruri & Bambang Syaeful, (2014), environmental damage is caused by human behaviour who has high individuality and basic human nature to use natural resources excessively, without caring about the preservation of nature. This view further provides an understanding for humans to position themselves as control of the environment (human as in control of the natural environment). Therefore, efforts are needed to prevent and minimize the impact of environmental damage caused by humans by caring for the environment that is generated by manifesting environmentally friendly behaviour. Environmentally friendly behaviour is defined as a conscious action taken by a person with the intention of minimizing the negative impact of human activities on the environment or to improve the environment either directly or indirectly (Kollmuss & Agyeman, 2002)

More specifically, this environmentally friendly behaviour is evidenced by actions that pay attention to environmental sustainability and resilience, such as using water and electrical energy efficiently, using environmentally friendly technological equipment, using everyday means of transportation that do not pollute the environment, do not throw garbage carelessly, reducing the use of plastic bags, minimizing piles of waste from products or food consumed, and other behaviours that contribute positively to the environment (Lehman & Geller, 2004).

Overcoming the ecological crisis is not only a technical matter, but it is necessary to explore the ins and outs of human spirituality, view of life, awareness of nature, to ecological behaviour that maintains the balance of nature. For that we need human ecological intelligence. Intelligence is an indication of an individual's ability to capture, process and respond to knowledge in adaption to the physical and social environment (Istiadi, 2016), while ecology according to Ernest Haeckel 1866, in Malik et al., (2018) is a comprehensive science that studies the relationship between organisms and their environment. Ecological intelligence is in the form of understanding and translating human relationships with all elements and other living things. Ecological intelligence is a deep empathy and concern for the environment, as well as a critical way of thinking about what happens in the environment as a result of our treatment (Jung, 2010). Meanwhile, Gardner (2013) mentions that ecological intelligence with naturalist intelligence, which is the human ability to understand natural phenomena, show ecological awareness and demonstrate human sensitivity to nature.

Meliono (2007) states that a person's knowledge is influenced by several factors, namely education, media and information exposure. The same thing was also expressed by Inkeles & Smith in Sugiarti (2012) which stated that in addition to school (education), mass media (information) is an important factor in influencing ways of thinking, attitudes and behaviour. Information is one of the most basic needs of society, with information society can build knowledge and views about an event or event. The need for information demands that people consume mass media, this is because mass media are tools in communication that can spread messages simultaneously, quickly to a wide and heterogeneous society. The advantage of mass media compared to other types of communication is that it can overcome space and time barriers. Even the mass media are able to spread messages almost immediately at an unlimited time (Nurudin, 2007).

The emergence of information and communication technology has changed the orientation of information needs in Indonesia, marked by the digitization of mass media so that online media in the form of television, radio and internet-based newspapers have emerged (Sucahya, 2013), especially Java Island ranks first in the percentage of internet users in Indonesia with 94.14 million users out of 171.17 million users, the total population of Indonesia (APJII, 2019). The survey of the Indonesian Internet Service Users Association (APJII) in 2018 stated that internet users were dominated by the 10 to 19 years age group, in which individuals were currently attending middle school, either first or late. Based on the 2017 health profile of Indonesia, the information data research of the Ministry of Health of the Republic of Indonesia 2017 stated that Indonesia has a young population composition, dominated by 33 million young children / toddlers. This large amount is of course a demographic bonus for Indonesia, which, if used properly, can determine the nation's future. The demographic bonus is a situation in which the number of productive age population is greater than the number of non-productive age population that will be experienced by Indonesia in the 2025-2030 period (Rahmadani, 2019).

It is not impossible if the age of domination of internet users today becomes a role model for the productive age in preserving the environment by behaving in an environmentally friendly manner. Therefore, education exists as a forum for transferring knowledge and skills in order to improve the quality of human resources. Good quality human resources can be supported by good education (Vindriyana, 2017). The government, through the Indonesian Ministry of National Education, has instilled a character building that cares about the environment and a responsible attitude through education since 2010 which is contained in the National Action Plan for Character Education and Presidential Regulation No. 87 of 2017 concerning strengthening character education. The national policy for character education is carried out in order to realize the goals of national education namely, to develop the potential of students to become human beings who believe and fear God Almighty, have noble character, are healthy, knowledgeable, capable, creative, independent, and become democratic citizens and responsible (Purwanti, 2017).

Realizing this, it is appropriate if this problem is studied more deeply through a study of related variables that can make a meaningful contribution, namely "The Relationship between Ecological Intelligence and Media Exposure with Environmentally Friendly Behaviour in Private Junior High School Students in DKI Jakarta".

Method

This research uses quantitative methods through correlational studies, namely research related to data collection to determine whether there is a relationship between variables and the level of the relationship, the level of the relationship is expressed by the correlation coefficient. In this study, the independent variable is ecological intelligence and media exposure, while the dependent variable is environmentally friendly behaviour.

The target population in this study were all private junior high school students in Jakarta. Meanwhile, the affordable population is all students of grade 8 Private Junior High School in three schools in three municipalities, namely South Jakarta (SMP Labschool Kebayoran), Central Jakarta (SMP Istiqlal Jakarta), and East Jakarta (SMP Laboratorium Jakarta), the sampling technique used in this research is cluster random sampling.

The sampling stages are as follows:
1) The researcher determines the population into several separate groups called clusters in three municipalities, namely South, Central, and East Jakarta and then randomly selects private schools in the three clusters.
2) The researcher determines the sample using the Slovin formula, from the 800 targets population of the study, 90 samples are obtained.
3) The 90 samples will be given a research questionnaire containing research instruments.
4) Steps to obtain data in this study using instruments as measuring tools, instruments are prepared with reference to the theory used. The development and composition of the instrument is taken through several steps:
   a. Reviewing theories related to research variables, namely environmentally friendly behaviour, ecological intelligence, and media exposure.
   b. Develop indicators based on the dimensions of each variable and aspects to be measured.
   c. Writing down statement items using a rubric for the measurement scale. To test the validity of the instrument items, trials were conducted.

To test the instrument is suitable for use or not, there are two indicators: validity and reliability. To get a clear picture and to avoid different interpretations, it is necessary to explain some terms and how to measure the variables used for this study according to the variables to be studied.

The instrument used to measure environmentally friendly behaviour is a question statement based on the dimensions of Kaiser & Wilson (2004), which generally can be grouped into 6 dimensions (Energy Conservation, Transportation and Mobility, Waste Avoidance, Consumerism, Recycling, and Vicarious Social Behaviour toward Conservation). The question consists of 15 statements with 5 alternative answers. The highest answer was given a score of 5 while the lowest was given a value of 1. The instrument used was calculated using the Microsoft Excel 2016 application and SPSS Ver. 20.

Based on the validity test of 15 statement items, there is 1 invalid question. So that 14 valid items were used to collect the next data. Researchers also tested the validity of the Ecological Intelligence Instrument as many as 15 statements, there was 1 invalid question, so 14 valid items were used to capture the next data. Finally, the researcher validated the Media Exposure Instrument as many as 9 short statements which were used to capture the next data.

The calculation of Environmentally Friendly Behaviour instrument item reliability coefficient uses the Cronbach Alpha coefficient, with the help of Ms. In Excel 2016, data obtained from the Cronbach Alpha coefficient of Environmentally Friendly Behaviour is 0.675.

Furthermore, the requirements analysis test is carried out and the results of the calculation analysis show that the sample has a normal distribution and the sample shows a homogeneous population, then the research hypothesis can be tested.

Results and Discussion

From the processing of the data obtained, after carrying out and fulfilling the analysis requirements test, which includes: (1) test for normality of population distribution using the Liliefors technique, and (2) test for homogeneity of variance using the Bartlett test.

Furthermore, it is necessary to conduct hypothesis testing whether or not there is an influence between one variable and another which is then expressed in the form of a mathematical equation (regression) either partial or multiple.

Table 1. Test of Partial Regression Equation X_1 to Y

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	**Std. Error**	**Beta**		
(Constant)	68.566	5.045		13.592	.000
ECOLOGICAL INTELLIGENCE	.400	.102	.388	3.943	.000

Based on the results of partial regression analysis for variables X_1 against Y, the regression equation is obtained $\hat{Y} = 68{,}566 + 0{,}400X_1$.

Table 2. Test of Partial Regression Equation X_2 to Y

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	**Std. Error**	**Beta**		
(Constant)	79.819	6.324		12.621	.000
1 MEDIA EXPOSURE	.346	.070	.465	4.922	.000

Based on the results of partial regression analysis for variables X_2 against Y, the regression equation is obtained $\hat{Y} = 79{,}819 + 0{,}346X_2$.

Table 3. Multiple Linear Regression Equation Test

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	(Constant)	105.125	7.312		14.377	.000
1	ECOLOGICAL INTELLIGENCE	.454	.086	.439	5.293	.000
	MEDIA EXPOSURE	.379	.062	.509	6.136	.000

a. Dependent Variable: ENVIRONMENTALLY FRIENDLY BEHAVIOUR

Based on the results of multiple linear regression analysis for variables X_1 and X_2 against Y, the regression equation is obtained $\hat{Y} = 105,125 + 0,454X_1 + 0,379X_2$.

Before the regression equation test results above are used to determine the effect of the independent variable on the dependent variable whether there is a significant linear effect or not, the regression equation must meet the criteria for meaning and linearity. The test criteria are (1) Comparing the significance value (Sig.) With 0.05, if the value of Deviation from Linearity Sig. > 0.05, then H_0 is rejected and H_1 is accepted, (2) comparing the value of F count and F table if the value of $F_{count} < F_{table}$, then there is a significant linear relationship between the independent variable and the dependent variable.

In the results of the calculation of the linearity test and the significance of the variable X_1 to Y, the Deviation from Linearity (Sig.) Value is $0.194 > 0.05$ and the F count and F table$_{(2; 88)}$ values $1.87 < 3.10$. Then, the results of the calculation of the linearity test and the significance of the variable X_2 on Y obtained the value of Deviation from Linearity (Sig.) is $0.646 > 0.05$ and the value of F count and F table$_{(2; 88)}$ $0.875 < 3.10$.

Because the Deviation from Linearity Sig. bigger than 0.05 and F count smaller than the F table value, it can be concluded that there is a significant linear relationship between the ecological intelligence variable (X_1) and the environmentally friendly behaviour variable (Y), and the media exposure variable (X_2) with the behavioural variable. environmentally friendly (Y). Thus the regression equation $\hat{Y} = 68.566 + 0.400X_1$ and the regression equation $\hat{Y} = 69.819 + 0.346X_2$ can be used to predict the relationship of the dependent variable Y using the independent variables X_1 and X_2, which means that every 1 unit increase in the independent variable will be followed by an increase. the dependent variable is 0.400 (X_1) and 0.346 (X_2). The sign (+) indicates that if the variable X_1 or ecological intelligence and X_2 or media exposure increases, then the variable Y or environmentally friendly behaviour also increases.

To determine the effect of variables X_1 and X_2 together (simultaneously) on variable Y, whether there is a significant effect or not, the regression equation is tested by the F test or the regression coefficient test. The test criteria are (1) Based on the significance value (Sig.) of the Anova output, (2) Based on the comparison of the F value calculated with F table.

Table 4. ANOVA Table Simultaneous Significance Test (F Test)

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	1859.529	2	929.764	29.839	.000[b]
1	Residual	2710.871	87	31.159		
	Total	4570.400	89			

a. Dependent Variable: ENVIRONMENTALLY FRIENDLY BEHAVIOUR

b. Predictors: (Constant), MEDIA EXPOSURE, ECOLOGICAL INTELLIGENCE

Based on the SPSS output table above, it is known that the Sig. is equal to 0,000 and the calculated F value in the table above is 29,839. Because the Sig. 0.000 < 0.05 and F count 29.839 > F table$_{(2; 88)}$ 3.10, then the hypothesis is accepted or in other words, ecological intelligence (X_1) and media exposure (X_2) simultaneously affect environmentally friendly behaviour. Thus, it can be concluded that the regression equation $\hat{Y} = 105.125 + 0.454X_1 + 0.379X_2$ is significant.

The strength of the relationship between ecological intelligence and environmentally friendly behaviour is indicated by the value of the partial correlation coefficient, the correlation between variables can be seen through the following decision making: (1) If the value of Significance (2-tailed) > 0.05, then H_0 is accepted and H_1 is rejected (2) If the value of Significance (2-tailed) < 0.05, then H_0 is rejected and H_1 is accepted.

Table 5. Partial Correlation X_1 with Y, X_2 with Y and X_1, X_2 with Y

		ECOLOGICAL INTELLIGENCE	MEDIA EXPOSURE	ENVIRONMENTAL LY FRIENDLY BEHAVIOUR
ECOLOGICAL INTELLIGENCE	Pearson Correlation	1	.102	.388[*]
	Sig. (2-tailed)		.340	.000
	N	90	90	90
MEDIA EXPOSURE	Pearson Correlation	.102	1	.465[*]
	Sig. (2-tailed)	.340		.000
	N	90	90	90
ENVIRONMENTALLY FRIENDLY BEHAVIOUR	Pearson Correlation	.388[*]	.465[*]	1
	Sig. (2-tailed)	.000	.000	
	N	90	90	90

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

From the results of the partial correlation test above between the ecological intelligence variable (X_1) and the environmentally friendly behaviour variable (Y), the partial correlation coefficient value is 0.388 which is positive with the weak relationship category (Sujarweni, 2015), and Significance (2-tailed) of 0,000. Whereas in the media exposure variable (X_2) with environmentally friendly behaviour variables (Y), the partial correlation coefficient value is 0.465 which is positive with the strong relationship category (Sujarweni, 2015), and

Significance (2-tailed) of 0.000. Because the value of 0.000 < 0.05, then H_0 is rejected and H_1 is accepted, which means that the relationship between ecological intelligence and environmentally friendly behaviour and media exposure with environmentally friendly behaviour is significant.

In the multiple correlation test, the correlation between the independent and dependent variables can be seen through the following decision making: (1) Based on the Sig. (2-tailed): if the value is Sig. (2-tailed) < 0.05 then there is a correlation between the variables connected, if > 0.05 then there is no correlation, (2) Based on the calculated r value (Pearson Correlation): if the value of r_{count} > r_{table} then there is a correlation between variable, if r count < r table then there is no correlation, (3) Based on the star sign (*) given by SPSS: if there is an star sign (*) or (**) on the Pearson correlation value then there is a correlation between the variables analyzed. On the other hand, if there are no stars in the Pearson correlation value, there is no correlation between the analyzed variables.

From the results of the multiple correlation test above between variables based on the Sig (2-tailed) significance value from the output table above between ecological intelligence (X_1) and environmentally friendly behaviour (Y) is 0.000 < 0.05, which means that there is a correlation between significance. between the variables of ecological intelligence and environmentally friendly behaviour variables. Furthermore, the relationship between media exposure (X_2) and environmentally friendly behaviour (Y) has a Sig. (2-tailed) of 0.000 < 0.05, which means that there is a significant correlation between media exposure variables and environmentally friendly behaviour variables.

Based on the calculated r value (Pearson Correlation), it is known that the calculated r value for the relationship between ecological intelligence (X_1) and environmentally friendly behaviour (Y) is 0.388 > r table 0.205, so it can be concluded that there is a relationship or correlation between the ecological intelligence and the environmentally friendly behaviour variable. Furthermore, it is known that r count for the relationship of media exposure (X_2) with environmentally friendly behaviour (Y) is 0.465 > r table 0.205, it can be concluded that there is a relationship or correlation between media exposure variables with environmentally friendly behaviour variables. Because r count or Pearson Correlation in this analysis is positive, it means that the relationship between the two variables is positive, or in other words the increasing ecological intelligence and media exposure will increase environmentally friendly behaviour.

Based on Table 6, it is known that the Pearson Correlation value between each of the linked variables has one star sign (*), this means that there is a correlation between the variables associated with a significance level of 5%.

Table 6. Test of the Coefficient of Determination X_1 against Y

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.388ᵃ	.150	.141	6.644

a. Predictors: (Constant), ECOLOGICAL INTELLIGENCE

The coefficient of determination is the square of the correlation coefficient value between X_1 and Y of 0.388, namely 0.388 x 0.388 = 0.150. The amount of the coefficient of determination (R Square) is 0.150 or equal to 15%. This figure implies that the ecological intelligence variable (X_1) affects the environmentally friendly behaviour variable (Y) by 15%.

Table 7. Test of the Coefficient of Determination X_2 against Y

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.465[a]	.216	.207	6.382

a. Predictors: (Constant), MEDIA EXPOSURE

The coefficient of determination is the square of the correlation coefficient between X_2 and Y of 0.465, which is 0.465 x 0.465 = 0.210. The coefficient of determination (R Square) is 0.210 or equal to 21%. This figure implies that the media exposure variable (X_2) affects the environmentally friendly behaviour variable (Y) by 21%.

The test result above indicate that media exposure contributes more to environmentally friendly behaviour than ecological intelligence. This difference can be explained by the coefficient of determination $X_2 > X_1$ or $0.210 > 0.150$. These results indicate that the contribution given by ecological intelligence to the result of environmentally friendly behaviour scores is smaller than the contribution of media exposure.

Media exposure made a greater contribution because of the percentage of individuals who were exposed to the media, out of 171.17 million Indonesians, 94.14 million of whom were on the island of Java, and dominated by ages 10 to 19 years (APJII, 2019) who were in that range. The individual is currently attending middle school, either first or late. In addition, Rakhmat (2004) states that the stimuli (media exposure) are considered because they have several prominent characteristics, one of which is repetition. Things that are presented repeatedly when accompanied by slight variations will attract attention, in this case the familiarity element (which we know) combines with the novelty element (which we just know). Repetition also contains an element of suggestion affecting our subconscious, so that later conative effects or related to behaviour can be manifested, in this case environmentally friendly behaviour. Media exposure is the initial stimulus that an individual receives, then the substance of the media that hits the student can be recognized and measured its ecological impact through ecological intelligence. Therefore, the two independent variables have a positive relationship individually or collectively in an effort to form environmentally friendly behaviour. Then it can be predicted that two variables can't be ignored, because they support each other.

The strength of the relationship between ecological intelligence and environmentally friendly behaviour is indicated by the value of the partial correlation coefficient, while the correlation between variables can be seen through the following decision making: (1) If the value of Significance (2-tailed) > 0.05, then H_0 is accepted and H_1 is rejected. (2) If the value of Significance (2-tailed) < 0.05, then H_0 is rejected and H_1 is accepted.

Table 8. Test of the Coefficient of Determination X_1 and X_2 against Y

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.638[a]	.407	.393	5.582

a. Predictors: (Constant), MEDIA EXPOSURE, ECOLOGICAL INTELLIGENCE

The coefficient of determination is the square of the correlation coefficient value between X_1 and X_2 with Y of 0.638, namely 0.638 x 0.638 = 0.407. The coefficient of determination (R Square) is 0.407 or equal to 40.7%. This figure implies that the ecological intelligence variable (X_1) and the media exposure variable (X_2) simultaneously (together) affect the environmentally friendly behaviour variable (Y) by 40.7%. While the rest is influenced by other factors, such as: relationship to nature, personality, and condition (Krajhanzl, 2010). Therefore, the government needs to integrate environmental education curriculum into local content, so that students can find out what environmental problems are occurring and their ecological impacts, so that students can at least know or prevent environmental problems around their neighborhood and also increasing media propaganda about the importance of environmentally friendly behaviour and its ecological impact continuously, so that the community, especially students, who incidentally as The Next Future Leader, will be moved and openly accept this information and then make themselves individuals who are ready to protect the environment by behaving friendly to the environment.

Conclusion

Based on the research results that have been described, the conclusions obtained from this study:

Media exposure made a greater contribution than ecological intelligence because of the stimuli (media exposure) are considered because they have several prominent characteristics, one of which is repetition. Things that are presented repeatedly when accompanied by slight variations will attract attention, in this case the familiarity element (which we know) combines with the novelty element (which we just know).

There is a positive relationship between Ecological Intelligence, Media Exposure and Environmentally Friendly Behaviour This means that the better / higher the students 'ecological intelligence or media exposure the better / higher their environmentally friendly behaviour. Therefore, ecological intelligence and media exposure are important variables to improve students' environmentally friendly behaviour.

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