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RELATIONSHIP BETWEEN ENVIRONMENTAL LITERACY WITH SELF EFFICACY IN BIOLOGY LEARNING CLASS X HIGH SCHOOL

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ABSTRACT

In the era of the industrial revolution 4.0, technology is developing more rapidly, which cannot avoid large energy needs. Using large amounts of energy results in exploiting energy sources and causes environmental damage. Implementing environmental education is one of the efforts to prevent environmental damage by fostering environmental literacy. Self-efficacy beliefs are important for students to deal with situations or problems. This type of research is quantitative correlation using Pearson Product Moment (PPM) correlation data analysis. This study explains the relationship between environmental literacy and self-efficacy in learning biology class X SMA. The sampling technique in this study is simple random sampling. The total sample size is 180 students of class X MIPA at SMA Negeri 14 Semarang. The results of the calculation of the Pearson Product Moment (PPM) correlation analysis using the IBM SPSS 22 application for windows obtained a count = 0.331 and the value of Sig. = 0.007. Value of Sig. Obtained <0.05, so Ha accepted that there is a relationship between environmental literacy and self-efficacy in learning biology class X SMA.

Keywords: Environmental Literacy, Self-efficacy, Learning Biology

INTRODUCTION

Technological developments in the 21st century will affect all activities in life (Kuncahyono et al., 2020). Advances in science and technology bring changes in human life (Rofi'ah et al., 2016). Currently, most human activities require technology to carry out daily activities.

Fast technological advances in various fields cannot be avoided from large energy needs (Isnaini et al., 2020; Siregar & Warman, 2017). Energy needs are increasing year by year along with the increase in consumers, industrial and business growth (Siregar & Warman, 2017). According to Gunawan, (2021) in general the energy source that is widely used is energy derived from fossils. This results in massive exploitation of fossil energy sources, resulting in environmental damage so that the ecosystem becomes unstable. The arrangement of abiotic and biotic characteristics around us is a natural condition found in an environment (Chaerul et al., 2021).

The activities of human life cannot be separated from the environment. but it turns out that daily activities carried out by humans can have a negative impact on the environment, namely pollution of the environment (Karyanto et al., 2018; Pratama et al., 2020; Liu & Guo, 2018; Nugroho et al., 2018). The cause of environmental pollution is due to increased exploitation by humans of nature (Maesaroh et al., 2021). Keraf (2010) adds that environmental damage and pollution that occurs in the sea, rivers, forests, land, air both on a national and international level is due to human activities that are less aware of the environment. The activity is formed from knowledge (knowledge) and attitudes that are lacking so that humans tend to do

bad things for themselves and their environment (Danhas & Danhas, 2020).

Education is one of the most valuable defense efforts in dealing with environmental problems (Saribas et al., 2014). Especially in environmental education which aims to develop individuals who are aware, caring, have motivation, attitudes, skills, knowledge and responsibility in finding solutions so that they can repair environmental damage that occurs. Saribas et al., 2014; Sigit et al., 2021; Karyanto et al., 2018; Liu & Guo, 2018 added that the aim of enriching environmental knowledge is to have environmentally responsible behavior and be able to pass on environmental protection habits to the next generation.

Environmental education is a means to foster environmental literacy (Srbinovski et al., 2010). Literacy is part of the 2013 Curriculum that must be achieved (Wahyuni et al., 2018). There are several types of literacy according to Rahmah et al., (2019), namely scientific literacy, digital literacy, and environmental literacy.

Environmental literacy is an individual's ability to define and understand environmental conditions that are implemented with appropriate behavior in an effort to restore and maintain environmental conditions (Kusumaningrum, 2018).

In recent years, environmental literacy has been considered an important component of environmental education (Saribas et al., 2014). Environmental literacy- based biology learning can be used as a solution to this problem because environmental education is not yet independent in schools (Leksono et al., 2020; Juseva, 2021). Biology learning invites students to love nature, also discusses the causes and consequences of environmental pollution (Rosdiana et al., 2020). In addition to integrating with biology subjects, environmental education is also integrated with the Adiwiyata program (Sigit et al., 2021). The implementation of the adiwiyata program is expected to create more comfortable learning conditions in schools and foster a sense of responsibility towards the environment for school residents (Afrianda et al., 2019).

Self efficacyIn everyday life, a person has a very important role. When someone is supported by beliefself efficacythen its potential can be used optimally (Rustika, 2016). Self efficacyis self-perception of good or bad in dealing with a situation (Alwisol, 2017). Previous research by Rosdiana et al., 2020; Saribas et al., 2014 the results show that there is a relationship between environmental literacy andself efficacy.

Preliminary study at SMA Negeri 14 Semarang through an interview with Mrs. Susi Erlianti, M.Pd. As a biology subject teacher, it is known that SMA Negeri 14 Semarang has been categorized as an independent Adiwiyata school since December 16, 2019. Environmental conservation activities continue to be carried out, including saving energy by turning off lights and fans after school, clean Fridays, and action movements. selecting and sorting waste. These activities are carried out as an effort to instill environmental education for school residents. However, there has never been a measurement of environmental literacy andself efficacyon students. Referring to the description, the research entitled **"Relationship between Environmental Literacy andSelf efficacyin Class X High School Biology Learning"** necessary.

METHODS

This research was conducted with a sample of 65 respondents from class X SMA Negeri 14 Semarang. Sampling using simple random sampling technique that applies the Slovin formula to determine the number of samples. Data on the level of environmental literacy of students was obtained by filling out multiple-choice and true-false tests and questionnaires. The indicator used to measure the level of environmental literacy adapts from the instrument developed by Liang et al., (2018). These indicators are cognitive,

affective and behavioral. Level dataself efficacy students obtained by filling out a questionnaire by the respondent. Indicators used to measureself efficacystudents adapted from the instrument developed by Bosscher & Smit, (1998). The indicators are initiative, effort and persistence. To find out there is a

relationship between environmental literacy andself efficacy Pearson Product Moment (PPM) test was conducted with the help of IBM SPSS 22 application for windows.

Before conducting the Pearson test, the prerequisite tests were carried out, namely the Normality test, Homogeneity test and Linearity test.

RESULTS AND DISCUSSIONS

The results of the environmental literacy test and questionnaire show that the variable environmental literacy obtained the highest raw score of 206 and the lowest raw score of 67 which was transformed into a score of 0-100. The transformation process obtained the highest score of 99 and the lowest 32.2. The average value of student environmental literacy is 76.6, median 76.9, mode 76 and standard deviation 11.2. The following table shows the frequency distribution and categorization of environmental literacy levels for class X students at SMA Negeri 14 Semarang.

Tabel 1. Distribution of Environmental Literacy Frequency Class X MIPA

No.	Interval	Frequency	Percentage
1.	31 – 40	1	1,54%
2.	41 – 50	1	1,54%
3.	51 – 60	2	3,08%
4.	61 – 70	9	13,85%
5.	71 – 80	29	44,62%
6.	81 – 90	19	29,23%
7.	91 – 100	4	6,15%
	Amount	65	100%

(Source: Processed primary data, 2022)

Tabel 2. Environmental Literacy Category Class X MIPA

No.	Score	Skor Rata - rata		Kategori
		f	f (%)	
1.	X ≥ 87,8	8	12,3%	Tinggi
2.	65,4 ≤ X < 87,8	48	75,4%	Sedang
3.	X < 65,4	8	12,3%	Rendah

(Source: Processed primary data, 2022)

Based on Table 2, it was found that the environmental literacy of students who were classified as "high" were 8 students with a percentage of 12.3%, environmental literacy of students who were included in the "medium" category were 49 students with a percentage of 75.4% and 8 students who belonged to the category environmental literacy is “low” with a percentage of 12.3%. So it can be concluded that environmental literacy with the highest percentage is in the medium category with a percentage of 75.4%.

Data acquisitionself efficacynamely the lowest raw value is 12 and the highest is 48 which is transformed into a score of 0 - 100. The transformation process gets the highest score of 100 and the lowest 25. The average valueself efficacystudents are 69.4, the median is 66.7, the mode is 64.6 and the standard deviation is 11.7. The following table of frequency distribution and level categorizationself efficacyclass X students at SMA Negeri 14 Semarang.

Tabel 3. Distribution of Self Efficacy Frequency Class X MIPA

No.	Interval	Frequency	Percentage
1.	24 – 34	1	1,54%
2.	35 – 45	0	0,00%
3.	46 – 56	3	4,62%
4.	57 – 67	30	46,15%
5.	68 – 78	19	29,23%
6.	79 – 89	10	15,38%
7.	90 – 100	2	3,08%
	Amount	65	100%

(Source: Processed primary data, 2022)

Tabel 4. Self Efficacy Category Class X MIPA

No.	Score	Skor Rata - rata		Kategori
		f	f (%)	
1.	X ≥ 87,8	8	12,3%	Tinggi
2.	65,4 ≤ X < 87,8	48	75,4%	Sedang
3.	X < 65,4	8	12,3%	Rendah

(Source: Processed primary data, 2022)

Based on research data and analysis of the relationship between environmental literacy andself efficacyin biology class X SMA, it is known that the average value of the average environmental literacy of students is 76.6, mode 76, and standard deviation 11.2. Results This shows that the

environmental literacy of class X SMA students is classified as moderate which can be reviewed in Table 2. Through the ability of environmental literacy that a person has, it can help minimize and solve environmental problems. This is in accordance with Liu & Guo's (2018) research that environmental education is a fundamental part that can grow students who are sensitive and understand phenomena that occur in the environment, solve environmental problems, prevent and minimize environmental damage.

Students will have good environmental literacy if it is supported by the implementation of environmental education in schools. Students' motivation to preserve the environment will also affect the level of environmental literacy of students. High or low environmental literacy of students can be influenced by various factors such as motivation (Siddiq et al., 2020), education (Nasution, 2011; Siddiq et al., 2020) and social (Ilhami, 2019). Meanwhile, according to Aini et al., (2020) these factors are in the form of student habits at home, school curriculum and parents. Sigit et al., (2021) added that one's ecological knowledge can be influenced by age and intensity of interaction with nature.

Data from research and analysis on the relationship between environmental literacy and self efficacyIn class X SMA Biology learning, it is known the average valueself efficacystudents are 69,4, the mode is 64.6 and the standard deviation is 11,7. The results show thatself efficacyClass X SMA students are included in the moderate category as shown in Table 4. Self efficacyindividuals are influenced by various factors such as information about self-efficacy, one's role in the environment, external intensity, the nature of the task obtained, gender and culture (Bandura, 1982).

The application of hypothesis testing is carried out after obtaining the mean value with the test Pearson Product Moment (PPM) assisted by the IBM SPSS 22 application for windows to analyze whether or not there is a relationship between environmental literacy and literacyself efficacyin biology class X SMA. Hypothesis test assessment obtained r count = 0.331, score sig. 0.007 and the range 0.20 – 0.399 and is classified as low. Ha is accepted and Ho is rejected because of the sig score. obtained <0.05 means that there is a relationship between the X variable (environmental literacy) and the Y variable (self efficacy). Score Sig. obtained are in the range of 0.20 – 0.399, it can be interpreted that there is a low relationship between environmental literacy andself efficacy.

These results are in accordance with research conducted by Saribas et al., (2014) that there is a slight but significant relationship betweenself efficacywith environmental education and environmental awareness. In addition, the results of this study are also in accordance with the results of research conducted by Rosdiana et al., (2020) that there is a positive relationship between self-efficacy and students' environmental literacy skills in learning pollution and environmental change. The more students care about environmental problems, the stronger their belief in studying biology related to environmental problems.

The relationship between environmental literacy andself efficacy low levels caused by the possibility of differences in perceptions for students between environmental problems where they believe they can solve them and the problems given (Muhazir et al., 2021). The relationship between environmental literacy andself efficacylow levels can also be caused by differences in the level ofself efficacyand environmental literacy in this study were in the medium category. This is in line with research conducted by Rosdiana et al., (2020) that the level ofself efficacyincluded in the very good category and environmental literacy included in the medium category resulting in a correlation between the two variables in the medium category, namely in the interval 0.400 – 0.599.

CONCLUSIONS

There is a relationship between environmental literacy andself efficacyin biology learning class X SMA with the results of the Pearson correlation test using IBM SPSS 22 for windows resulted in a score of rcount = 0.331 and a score of sig. = 0.007. Score Sig. obtained <0.05 so that Ho is rejected and Ha is accepted, then there is a relationship between environmental literacy andself efficacyin biology class X SMA. These results are classified as low in the range of 0.20 – 0.399.

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