

School Culture and Ecology

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Abstract. The environmental degradation caused by the high volume of vehicles, industrial activity, population growth and conversion of green open space. It is therefore necessary for human-based efforts to reduce the degradation of the environment. One of them can be done through the growth of ecological intelligence. The most effective growth of ecological intelligence at the age of 12 to 18 years. It is an age where humans are in secondary school. The growth of ecological intelligence can be done through school culture with environmental content in it. This research uses survey method based on quantitative approach and correlational research design. The technique of determining the number of samples using stratified random sampling, obtained 36 schools and 260 students. Data were collected by observation techniques, interviews, questionnaires, literature studies and documentation studies. The results showed that school culture has correlation with environmental condition. Thus, the exemplary aspect of teachers, principals, and educators have efforts to preserve the environment on school culture. The habitualization of school residents in preserving the environment in the school culture should be a centralized standard rule.

1. Introduction

Cimahi City is located in the downstream of the river and is adjacent to West Bandung regency, geographically it is a catchment area as well as water flow, for the sustainability of its environment provides carrying capacity to surrounding areas, especially Bandung, as the capital of West Java Province, the potential for environmental degradation should be reduced When people in Cimahi City have ecological intelligence.

Based on data from the Industry and Commerce Department of Cimahi City in 2015 there are about 200 industrial plants ranging from small, medium and large scale which of course the activity must be monitored and accompanied by the growth of consciousness among the youth of middle school age, because they are potential residents in Future growth of intelligence will also participate in industrial activities. The development of land use in Cimahi City.

Housing with an area of about 1200 Ha and an industry with an area of about 500 ha became the most widespread land use in Cimahi City (data of National Land Agency Cimahi in 2009). Communities engage in these two activities if they have ecological intelligence to behave with minimal impact on the surrounding environment.

Then data on urban potential in Cimahi City (2009) and Public Health Departement North Cimahi (2016) diseases caused by environmental degradation such as respiratory tract infection (ISPA) around 5000 people, vomiting about 4400 people and dengue about 2,400 people showed the level of environmental degradation can actually be prevented by growing the ecological intelligence of learners.



The volume of vehicles passing through Cimahi City based on data from the Cimahi City Transportation Department (2016) reached 215,488 vehicles of various sizes, indicating high levels of air pollution caused by vehicles. If people in this Cimahi City have ecological intelligence, the expectation is higher awareness to use environmentally friendly vehicles or mass vehicles, in order to reduce air pollution in Cimahi City.

According to the spatial plan of Cimahi City area 2015-2023 the development should provide green open space and enter into the regional planning budget. Cimahi city is adipura winner six times. Five of them are obtained in a row, a prestige that must be maintained. As reported by Kurnia (2016) Cimahi City has been recorded six times the City Cimahi get it, in 2008, 2009, 2010, 2011, 2012, 2015 and last on July 20, 2016 get trophy adipura kirana. This achievement and development, should be supported by the population by having ecological intelligence that grows and develops in middle school age, school culture is value, norm, beliveness and attitude with school facilities coul grow adn developed ecological intelligence [1, 2] and school culture could developed ecological intelligence students because its build school climate especially strong in environmental aspect[3].

If seen from various data it is seen that Cimahi City has potential for environmental damage. Ecological intelligence is very well grown at the age of 12-18 years where at that time learners are at the age of high school. Based on what has been described, showing that the growth of ecological intelligence in the City of Cimahi is very important, and interesting to study in a measurement and research with the title "Effect of School Culture to Ecological Intelligence Students at High School in Cimahi City".

Problem statement proposed in this study is "How effect of school culture to ecological intelligence students at high school in Cimahi City?". Purpose of writing the article of this research is analysis how effect of school culture to ecological intelligence students at senior high school in Cimahi City, then know influence of school culture on the ecological intelligence of high school students in Cimahi City is expected to enrich theoretical study of the growth of ecological intelligence. Practically expected to be one of the input materials that ecological intelligence can be built in senior hight school, it would be environmental sollution in the future.

2. Methods

This research used survey method. Being the basis of doing research stages such as the development namely (a) determination of destination and scope survey ie high school in Kota Cimahi; (b) design of research instruments including observation guidelines, questionnaires for and interview guides; (c) perform the validity and reliability test of the research instrument; (d) using a computer program in the form of microsoft excel and spss to perform analysis of research data; (e) taking into account the detailed characteristics of the respondents primarily being saasaran when the survey was conducted and (f) considering variations of the research results and how to address them [4].

Used quantitative approach, an approach based on quantity or phenomenon can be represented in the figures "quantitative research is based on the measurement of quantity or amount" [5]. It is applicable to phenomena that can be expressed in terms of quantity. Through this approach, the influence of school culture on the ecological intelligence of high school students in Cimahi City is then demonstrated in magnitude and how its equality influences.

Used correlational design in accordance with what will be studied is test the influence of the relationship between school culture with geography learning, that correlational design test causality with analysis analysis, cross-end panel (cross langed panel design) will prove the causal relationships of a correlational with the aim of (1) revealing relationships between variables and (2) predicting the subject's score on variables through scores on other variables [6]. The variables in this research are school culture as independent variable (X) and ecological intelligence of high school students in Cimahi City as dependent variable (Y). As in figure and table 1.

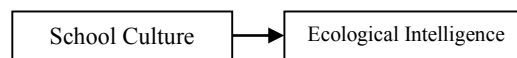


Figure 1. Research variables.
Source: Results of analysis 2017

Table 1. Indicators of these research variables.

No	Research Variable	Variable Dimention
1	School Culture	Environmental Content at School Culture
		a. Habitat in environmental conservation
		b. Exemplary principals, teachers and school employees in protecting the environment
		c. Participatory environmental-based activities
		d. The physical environment of the school
2	Ecological Intelligence	Ecological Intelligence Aspect
		a. Aspects of knowledge
		b. Aspects of attitude
		c. Skill aspect
		d. Participatory-based engagement aspects

Source: Results of analysis 2017

Populations and samples in this research consisted of two groups: the school population that became the object of research and learners in the school that became the object of research. The number of population and sample in this study was determined using Slovin equation [7]:

$$n = \frac{N}{1+N.\alpha^2} \quad (1)$$

Information :

N = Number of samples

N = Population size

A = 10% adjustment error rate adjusted by the researcher is the rest of the 90% confidence level

Total high school in Cimahi City:

- SMAN (State Senior Hight School) = 6
- SMPN (State Junior Hight School) = 13
- SMAS (Private Senior Hight School) = 10
- SMPS (Private Junior Hight School) = 24

Total high school in Cimahi City is 53 then sample in this research are:

$$n = \frac{N}{1+N.\alpha^2} = \frac{53}{1+53(0.1)^2} = \frac{53}{1.53} = 34.64 \text{ (rounded up to 35 schools)}$$

Total high school in Cimahi City is 53 then sample in this research is as follows:

- SMAN (State Senior Hight School) = $6/53 \times 35 = 3.96$ rounded to 4 schools
- SMPN (State Junior Hight School) = $13/53 \times 35 = 8.58$ rounded to 9 schools
- SMAS (Private Senior Hight School) = $10/53 \times 35 = 6.61$ rounded to 7 schools
- SMPS (Private Junior Hight School) = $24/53 \times 35 = 15.85$ rounded to 16 schools

Then the research samples were taken with stratified random sampling technique. So we get the school sample as follows table 2. Then the sample of students based on the population of all high school students in the city of Cimahi, which is the learner class XII and IX as the longest in school and get the influence.

Table 2. School sample in research.

SMAN (State Senior Hight School)	SMAS (Private Senior Hight School)	SMPN (State Junior Hight School)	SMPS (Private Junior Hight School)
SMAN 2 Cimahi	SMA Budi Luhur	SMPN Terbuka 2	SMP Budi Luhur
SMAN 3 Cimahi	SMA Pasundan 1	SMPN 8 Cimahi	SMP Darma Kartini
SMAN 5 Cimahi	SMA Pasundan 2	SMPN 9 Cimahi	SMP Kartika Siliwangi 3
SMAN 6 Cimahi	SMA Pasundan 3	SMPN 6 Cimahi	SMP Muhammadiyah 5
	SMA Santa Maria	SMPN 4 Cimahi	SMP Muslimin Cibeureum
	SMA Tut Wuri H	SMPN 2 Cimahi	SMP Pasundan 1 Cimahi
	SMA Warga Bakti	SMPN 11 Cimahi	SMP Pasundan 2 Cimahi
		SMPN 10 Cimahi	SMP PGRI 1 Cimahi
			SMP PGRI 3 Cimahi
			SMP PGRI Cibeureum
			SMP PGRI Leuwi Gajah
			SMP Plus Darusurur
			SMP Taruna Mandiri
			SMP Tutwuri Handayani
			SMP Warga Bakti
			SMPP PGRI 4 Cimahi

Source: Results of analysis 2017

- Number of students of class XII SMAN (State Senior Hight School) = 680
- Number of students of class XII SMAS (Private Senior Hight School) = 342
- Number of students of class IX SMPN (State Junior Hight School) = 2877
- Number of students of class IX SMPS (Private Junior Hight School) = 2166

The total population of high school students 6065

To determine the sample of learners, the researcher uses the equations developed to determine the minimum sample count before rounding and the proportion of the sample [4], this equation is used to attract samples from a relatively large and hoterogen population, with a 10% error rate, Population that has been explained then the number of samples in this study are as follows [8]:

$$n = \frac{\lambda^2 . N . P . Q}{d^2 (N-1) + \lambda^2 . P . Q} \quad (2)$$

$$\begin{aligned} \lambda &= \text{Chi Square error } 10\% = 2.706 \\ P &= Q = 0.5 \\ d &= 0.05 \end{aligned}$$

The equation based on the calculation of Isaac and Michael development results with the tables they developed, obtained sample value of 6010 population with interpolation between 6000 to 7000, with the value of S attached to the table, as follows:

$$I = \frac{S_{7000} - S_{6000}}{t_{max} - t_{min}} X (t_{count} - t_{min}) \quad (3)$$

$$I = \frac{261-259}{7000-6000} \times (6010 - 6000) = 0.02 + 259 = 259.02 \text{ (sample research } \underline{260} \text{ students)}$$

Thus the proportion of samples in this study with a minimum of 260 learners is divided into the following proportions:

$$SMAN = \frac{680}{6065} \times 260 = 29.15 = 29$$

$$SMAS = \frac{342}{6065} \times 260 = 14.66 = 15$$

$$SMPN = \frac{2877}{6065} \times 260 = 123.33 = 123$$

$$SMPS = \frac{2245}{6065} \times 260 = 96.24 = 97$$

Based on the equation we get the sample number with rounding to 263 learners. Furthermore the number of samples is divided equally in each school with the equations, roundings and proportions of previously presented samples. Data collection by (a) observations used to collect environmental content data on school culture on aspects of school physical environment; (b) interviews used to collect environmental content data on school culture, in particular aspects of habituation, exemplary and participation; (c) questionnaires or questionnaires used to obtain the ecological intelligence data of secondary school students with aspects of knowledge, attitude, skills and participation.

Then, data analysis with (a) measurement scale of respondents' answers with rating scale (1-4 and 1-5) for all aspects of research variables [9], Likert Scale for Attitude Aspect with 1-4 range [10] gutman scale (0 or 1) to provide respondents scores on specific ecological intelligence tests for aspects knowledge; (b) mean analysis to interpret the score [11, 12]; (c) simple regression analysis (t test) based on correlation test that is meant to get correlation value and equalition of school culture influence to ecological intelligence of learners which also contains classical assumption test which includes normality test, linearity, multicollinearity and heteroskedasticity as requirement doing regression analysis [13, 14].

Instruments in this research were developed by previously conducted several tests that include (a) validity test with pearson product moment correlation; (b) test of reliability with cronbach alpha test; (c) the problem-level test of difficulty and distinguishing power of special problems examines the question of knowledge as one of the aspects of ecological intelligence. the test questions were conducted on high school students representing various clusters namely students of class XII sman 1 cimahi, sma muhamadiyah 1 cimahi, students of class IX smp negeri 5 cimahi and smp wiyata bakti each 15 people. The result of the instrument test shows the proportion of knowledge concerning either the junior high school or upper level has the proportion of easy, medium and high. The differentiating power of the problem is in the classification satisfactory to good. The validity test shows that out of the total 60 questions tested there are 11 invalid questions that are not used in the research. Reliability shows that all aspects are on a score > 0.70 means reliability is very high.

3. Results and Discussion

3.1. Research location

The location of this research is located in Cimahi City which is one of the cities located in West Java Province located at 107° 30 '30 "BT to 107° 34' 30" BT and 6° 50 "00" - 6° 56 "00" South Latitude with Total area of about 40.25 km². Administratively Cimahi City has several constraints covering the north with West Bandung regency, south of Bandung regency, the east with the city of Bandung and the western borders of West Bandung regency. The city has three sub-districts namely North Cimahi Sub-district with Cipageran, Citeureup, Cibabat and Pasikaliki Villages. South Cimahi with sub district

Cibeber, Leuwigajah, Main, Look and International as well as the sub district of Hyderabad Central Baros, Cilame, Karangmekar, Setiamanah, Cimahi and Hamburg. Cimahi City has 56 high schools as educational institutions that play a role to shape ecological intelligence at a potential age. Consisting of 6 State Senior High School (SMAN) 10 Private Senior High School (SMAS), 13 Junior Secondary Schools (SMP) and 24 Private Junior High Schools (SMPS) are scattered throughout the existing outposts in Cimahi City. Each school has characteristics of learners that are different from each other.

3.2. *Environmental content in school culture and ecological intelligence of high school students in Cimahi City*

Table 3 shows how the scores of environmental content of the school culture with measurement aspects of habituation, modeling, school physical environment and participatory activities. For SMAN 3 Cimahi high school high school is the highest score of environmental content in school culture, in SMAS Santa Maria get the first scoring sequence, the SMPN 9 Junior High School grade is first and SMPS, PGRI 3 is on the highest score of school culture score . The highest score in the environmental load in school culture as in table 3 is exemplary and habituating while the lowest aspect is the participatory aspect. Overall value of environmental load in school culture is SMAN 3 Cimahi (3.92) and the lowest score is SMP Budi Luhur (2.60).

The value of intelligence of high school students in SMAN is obtained by SMAN 6 Cimahi, for SMAS obtained by SMA Santa Maria, for SMPN obtained by SMPN Terbuka 2 Cimahi and for SMPS is occupied by SMP Pasundan 1 and Tut Wuri Handayani. Measurements are made on aspects of knowledge, attitudes, skills and participation in environmental conservation efforts. Overall, the highest ecological value of learners is obtained by SMAN 6 Cimahi and the lowest ecological intelligence score is occupied by SMA Pasundan 1 Cimahi.

Table 3. Environmental content in school culture and ecological intelligence students score.

School	Environmental Content in School Culture	Ecological Intelligence	School	Environmental Content in School Culture	Ecological Intelligence
	Score	Score		Score	Score
SMAN 2 Cimahi	3.68	2.71	SMPN 10 Cimahi	3.64	2.55
SMAN 3 Cimahi	3.92	2.74	SMP Budi Luhur	2.60	2.52
SMAN 5 Cimahi	3.20	2.62	SMP Darma Kartini	2.92	2.26
SMAN 6 Cimahi	3.52	2.69	SMP Kartika Siliwan	2.64	2.25
SMA Budi Luhur	2.68	2.38	SMP Muhammadiyah 5	2.96	2.43
SMA Pasundan 1	2.88	2.66	SMP Muslimin	2.80	2.33
SMA Pasundan 2	3.12	2.46	SMP Pasundan 1	2.96	2.54
SMA Pasundan 3	3.00	2.31	SMP Pasundan 2	2.84	2.40
SMA Santa Maria	3.60	2.71	SMP PGRI 1 Cimahi	3.04	2.46
SMA Tut Wuri H	2.64	2.48	SMP PGRI 3 Cimahi	3.24	2.25
SMA Warga Bakti	2.68	2.46	SMP PGRI 4 Cimahi	3.00	2.55
SMPN Terbuka 2	3.20	2.72	SMP PGRI Cibeure	2.72	2.55
SMPN 9 Cimahi	3.92	2.52	SMP PGRI Leuwi G	2.72	2.36
SMPN 8 Cimahi	3.52	2.55	SMP Plus Darusurur	2.88	2.39
SMPN 6 Cimahi	3.64	2.62	SMP Taruna Mandiri	2.64	2.51
SMPN 4 Cimahi	3.20	2.40	SMP Tut Wuri H	3.36	2.54
SMPN 2 Cimahi	3.20	2.55	SMP Warga Bakti	2.88	2.62
SMPN 11 Cimahi	3.76	2.66			

Source: Results of analysis 2017

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3.3. The effect of school culture on student ecological intelligence

3.3.1. *Classical assumption test results test terms of influence.* Before the test of influence between school culture on the ecological intelligence of learners, tested the classical assumption as a condition of regression analysis. The results of the classical assumption test are as follows:

- **Data Normality.** Based on normality test results obtained the significance of school culture 0.617 ecological intelligence of learners 0.976 with probability value = 0.05 thus all values significance count > probability value indicated then all data to be done regression analysis has normal distribution and can be continued in the next analysis.
- **Data Linearity.** The value of linearity test result of culture bekolah (X) to the ecological intelligence of the ecological intelligence of learners (Y) = 0.700 < 3.24 (linear).
- **Heterokendasy Test.** Heterokendasy value by using scartter plot obtained results as in figure 2 where does not form a pattern so that no heterokendasy occur on the variables to be tested.

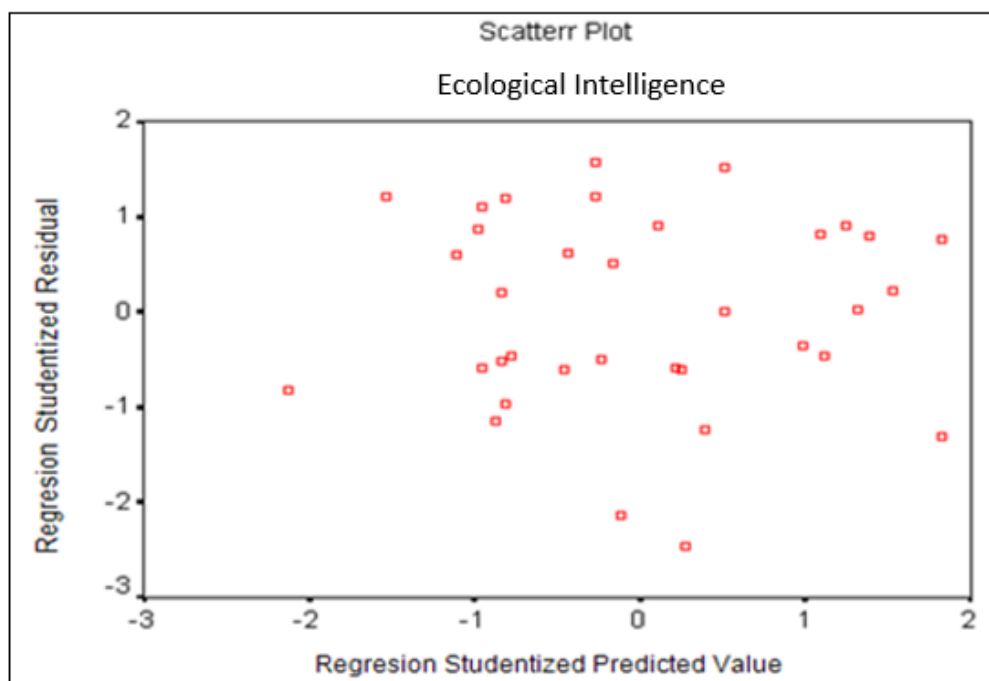


Figure 2. Heterotassity test results.

3.3.2. *The effect of school culture on student ecological intelligence.* The hypothesis proposed regarding the cultural influence (X) of the school on the ecological intelligence of learners (Y) is:

- Ha1: school culture (X) positively affects the ecological intelligence (Y) of high school students in Cimahi City.
- Ho1: school culture (X) has no positive effect on ecological intelligence (Y) high school students in Cimahi City.

Based on the analysis results obtained correlation (r_{ij}) or r_{Count} is 0,558 with significance level of influence (p) < 0.01 based on unstandardized coefficients value or regression coefficient 1,893 (a) and 0.197 (b) so that obtained linear regression equation of school culture (X) to intelligence Ecological (Y) $\hat{Y} = 1.893a + 0.197b$.

This shows that $r_{\text{Count}}(0.558) > r_{\text{table}}(0.430)$ with probability value < 0.01 then Ha1 is accepted and H01 rejected means there is a direct positive influence of school culture (X) on ecological intelligence (Y) of high school students in Cimahi City (0,558) with the classification of influence based on correlation coefficient value in table 3.18 where the correlation value of influence from 0.40 to 0.599 is in the classification of "moderate effect" meaning that the influence of school culture on ecological intelligence of learners is not too strong and not too weak. This figure shows the coefficient of determination (r^2) of 31.13% ($0.5582 \times 100\%$) means that school culture contributes to the formation of ecological intelligence of high school students in Cimahi City by 31.13% and the formation of the ecological intelligence of other learners 69.87% is the contribution factor Another, because only 31.13% then this also shows that ecological intelligence is not fully influenced by the existing culture in school.

The results of the analysis show that 31.13% of ecological intelligence is influenced by school culture that shows external factors, especially school culture, which influences the growth of ecological intelligence [15,16] personal construct theory George A Kelly and constructivist where ecological intelligence is formed from participants' Educated in translating the environment, the school culture consisting of several aspects that build the construct of the thought that habituation through rules, rewards and punishment to make learners assume that the behavior that gets rewards is something right and the behavior that get punishment is something wrong and the rules become A mind construction within the school culture participates in environmental conservation which indirectly becomes a truth for learners in particular to shape aspects of attitude in ecological intelligence, in line with behavioristic theory that intelligence can be formed through environmental control such as habituation. The result was teacher expectation realized with habitation to students has contributed to grow and developed ecological intelligence [17].

The cognitive social theory of Bandura and Mischel of ecological intelligence is formed depending on the social interaction of learners [15, 16], it also proves the exemplary aspect in the effort of environmental preservation to shape the ecological intelligence of learners, where exemplary in participating environment for learners Principals, teachers and educators into a social model center that shapes the ecological intelligence of learners especially in aspects of environmental preservation skills. It was mention that to built ecological intelligence are need many good aspect in school such as facilities and value [17]. The study established that school environment and peer influence made significant contribution to the students' academic performance [18].

School culture does not fully shape the ecological intelligence because internal factors can also be one of the factors that influence the formation of ecological intelligence such as the number that shows 69.87% that the ecological intelligence is influenced by other factors one of which is the internal factor in accordance with Carl Rogers phenomenological theory that intelligence is the perception of the individual and everyone has the ability to perceive the world, so that the views of each person is different as well as the ecological intelligence of each person is different because of memory and processing factors in the human brain is different. "Experience Alone Does Not Lead To Learning" its mean to build an experience we need so many aspect where se could find it in formal educatin (school) [19]

Proving Freud's psychoanalytical psychodynamic theory that everyone has a drive to do something, the drive is energy that is the response of environmental conditions, behavior that is influenced by environmental conditions. When receiving a response from the environment everyone will have the

expression or discharge of different energy depending on the energy capacity it has, when looking at environmental conditions that are not proper environmental conditions then the response of each person will vary whether to let it alone, whether to participate And damage it or vice versa. Makes the ecological intelligence of each person different depending on the energy in responding to environmental conditions. There are three point to built intelligence especially in school "...good teacher and good teaching in a good learning environment..." dan "...essential in creating an ethos of learning that will allow students to feel comfortable in the classroom..."[20]

According to the cognitive theory of Bandura and Mischel that everyone has different emotional impulses, it is related to the attitude aspect, the pro attitudes toward the environmental sustainability of each person is different depending on the urge to invite others In participating in preserving the environment and to what extent, and directly proportional to the biological theory that intelligence is highly dependent and is also determined by the capacity of the human brain itself.

The influence of school culture on ecological intelligence arises because in the school culture there are efforts to establish at the age of 12-18 years, learners vulnerable to external influences and information more easily enter in memory forming of intelligence (sematic memory). Because in school culture learners indirectly (1) train visual sensitivity in environmental conservation; (2) practice aroma stimulation with plenty of fresh air in the school environment; (3) the existence of control over the behavior especially affecting the environment. School culture also has ties and arrangements which are two important components in shaping aspects (1) attitude that supports the effort of environmental conservation; (2) skills in life in harmony with the surrounding environment and (3) participation with respect to environmental conservation activities. Aspects of knowledge gained in schools will be more practical and applicable.

4. Conclusions

The school culture with environmental content in it has a direct positive effect on ecological intelligence significantly with 31.13% contribution in shaping the ecological intelligence of learners, especially forming the pro attitudes toward the environment, life skills in harmony with the environment and participation in environmental conservation efforts.

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