Tersedia online di EDUSAINS
Website: http://journal.uinjkt.ac.id/index.php/edusains

EDUSAINS, 17 (1), 2025, 61-75

Research Artikel

CORRELATION BETWEEN KNOWLEDGE OF ECOSYSTEM CONCEPT BASED ON LOCAL WISDOM AND ENVIRONMENTAL SENSITIVITY WITH ECOLOGICAL BEHAVIOR

Sisi Hernanda Pratama[1], Diana Vivanti Sigit[2*], Ratna Komala[3]
[1,2,3]Master's Program in Biology Education, State University of Jakarta, Jakarta, Indonesia
dianavivanti@yahoo.com[2*]

Abstract

Several ecosystems have currently experienced damage due to several factors, both natural and due to human activities. Efforts to minimize this damage can be made by encouraging students to be aware of the natural resources around them, one of which is based on local wisdom. This study aims to analyze the relationship between knowledge of the concept of an ecosystem based on local wisdom and environmental sensitivity with ecological behavior. This study uses a quantitative descriptive approach with a survey method. Respondents consisted of 168 students of class X IPA SMAN 97 Negeri Jakarta, who were taken using a simple random sampling technique. Data testing in this study includes normality, homogeneity, and linearity for correlational and regression analysis. The results of the study showed that there was a positive and strong correlation between knowledge of ecosystem concepts based on local wisdom and ecological behavior, which was 64,8%. Based on these results, the implication in this research is that knowledge of ecosystem concepts based on local wisdom can be increased through strong ecological behaviors.

Keywords*: Ecosystem; ecological behavior knowledge; environmental sensitivity; local wisdom.*

***Permalink/*DOI:** https://doi.org/10.15408/es.v17i1.46112

How To Cite: Pratama, S. H., Sigit, D. V., Komala, R. (2025). Correlation Between Knowledge of Ecosystem Concept Based on Local Wisdom and Environmental Sensitivity with Ecological Behavior. *EDUSAINS*, 17 (1) : 61-75.

*Corresponding author
Received: 25 April 2025; Revised: 07 June 2025; Accepted: 28 June 2025
EDUSAINS, p-ISSN 1979-7281 e-ISSN 2443-1281

INTRODUCTION

Environmental issues have been a concern for the international world to date. The interaction that occurs between humans and the environment directly affects human behavior towards the environment including causing environmental damage (Vijeta et al., 2021). Various factors are indicated as triggers for environmental problems such as climate change, changes in natural resources, changes in technology and development, pollution and the most important factor is human activity (Mahaswa, 2019; Kaiser, Oerke, & Bogner, 2007). Human activity is said to be an important factor because of its role as an agent of environmental conservation. This situation refers to the ability of humans to be responsible for efforts to manage and resolve environmental problems(Lange & Dewitte, 2019).

In addition, other environmental damage is increasingly occurring from one year to the next. This condition is exacerbated by the loss of environmental balance that threatens the survival of humans and ecosystems (Setiawan, 2022; Azadi et al., 2019; Lange & Dewitte, 2019;). The balance of the ecosystem was initially well maintained, because the community maintained the environment by placing the environment as the main source of life, the pattern of human interaction with the environment was based on beliefs and myths or what is known in society as local wisdom. The balance of nature or ecosystems is currently no longer maintained because humans have begun to abandon local wisdom and there are increasing human needs that force humans to exploit the environment excessively (Pahlevy, Dewi, & Alimah, 2022; Solihin, Sigit, & Miarsyah, 2020). This indicates that maintaining the balance of the ecosystem requires the community to return to maintaining or utilizing the ecosystem with the provisions of local wisdom (Utari, Rusmadi, & Achmad, 2021).

Efforts to minimize environmental damage can be made by understanding the importance of preserving ecosystems based on local wisdom. A student who acquires knowledge of ecosystem concepts can become environmentally aware, enabling them to create a solution-oriented approach to environmental damage. This knowledge is very important for students to possess because it can implement values of sensitivity towards nature and animals, thereby caring for and preserving the Earth to make it better. The concept of the ecosystem serves as a foundation of knowledge in order to shape students who understand environmental sustainability. In line with the research by Firdaus, Lestari, Afiff, & Herdiansyah (2023), local wisdom can fulfill the resilience process in preparedness and post-natural disaster. Incorporating local knowledge into conservation efforts can help ensure that conservation strategies are effective and sustainable (Pahlevy et al., 2022).

Local wisdom can slowly be eroded by modernization, especially in big cities, such as Jakarta. The entry of residents from outside Jakarta and even from abroad adds to the diversity. Betawi local wisdom which is characteristic of the DKI Jakarta area and its surroundings has coexisted with outside Jakarta. Not only that, the results of BPS (2023) stated that the Betawi tribe also inhabits the buffer areas around Jakarta. Therefore, the Jakarta Government has begun to promote the image of Betawi Culture in Jakarta. This can be seen from the architecture and city accessories that are characterized by Betawi culture. The activities carried out have also included elements of Betawi culture in their implementation (Kusnadi, 2022).

The efforts made by the government have helped alleviate the anxiety of the people of Jakarta, especially the Betawi culture, in maintaining its identity. However, there is still a lack of knowledge about local wisdom-based ecosystems among students, as explained in Mailani et al., (2021) research, which states that students may not be exposed to local wisdom in their daily lives, leading to a lack of knowledge

about local wisdom. In line with the research by Ilhami & Sovia (2019) high school students do not understand the local wisdom present in their environment, resulting in a limited and relatively low level of understanding of local wisdom in Biology studies. The influence of globalization also causes a crisis of self-identity, leading to a focus on foreign cultures and a lack of appreciation for local wisdom (Budiarta, 2023). The lack of local ecosystem knowledge possessed by students also results in low levels of environmental sensitivity among students (Muchsin, Sriyati, & Solihat, 2023).

Based on the results of interviews with several students at SMAN 97 Jakarta, it was also found that environmental sensitivity is still unfamiliar to students. This ignorance proves that sensitivity has never been studied among students at school, students only know about environmental awareness or care (Pluess, Lionetti, Aron, & Aron, 2023; Cheng & Wu, 2015). However, in essence, sensitivity and awareness have similarities, namely the attitude to understand the environment. In addition, the low environmental sensitivity of students is caused by minimal knowledge about the environment, resulting in a lack of awareness and appreciation of environmental quality. This is in line with the research of Gurbuz & Ozkan (2019) which states that environmental knowledge among students in Turkey is still low, resulting in a low level of environmental sensitivity.

Schools have the function of transmitting and transforming culture, teaching cultural values from the older generation to the younger generation. Jakarta as a destination for migrants with various ethnicities inhabiting it, must be able to strengthen the character of its region. One way to strengthen character is through education (Suwardi & Rahmawati, 2019). The Merdeka Curriculum is a program in Indonesia that aims to provide more flexibility in learning and strengthen local wisdom and culture and is able to bridge the gap between education in schools and society (Kusnadi, 2022; Handayani, Wilujeng, & Prasetyo, 2018). Based on the results of observations of several Penggerak High Schools, the most widely chosen theme is the theme of local wisdom which can be packaged in the ecosystem concept to train students' competence in exploring natural and cultural wealth which makes students more sensitive to environmental problems (Sagiv & Schwartz, 2022). Environmental sensitivity in biology learning requires students to understand, feel, and provide solutions to environmental problems (Cater, 2022; Puspitaningrum, 2019).

Reasonable efforts that can accommodate environmental problems related to student knowledge are by implementing an understanding of the importance of preserving the environment supported by environmental awareness (Pettorelli et al., 2021). The form of awareness that is formed in a person in preserving the universe is called ecological behavior (Dornhoff, Sothmann, Fiebelkorn, & Menzel, 2019). Ecological behavior is an individual's effort to maintain the environment and minimize activities that can have a negative impact on the environment (Geiger, Otto, & Schrader, 2018). When students understand the importance of preserving and caring for the earth as a natural habitat for living things, then these students are certain to have ecological behavior. Ecological behavior can also develop into a culture of love for the universe. This will affect human lifestyle patterns through local wisdom knowledge that demands living in harmony with nature which will be reflected in a person's lifestyle patterns in loving the universe.

Based on the above explanation, the ecological behavior of students which is used as one of the efforts in solving environmental problems is suspected to be related to knowledge of ecosystem concepts based on local wisdom. However, limited research has explored the direct correlation between local wisdom-based ecosystem knowledge and ecological behavior among high school

 | p-ISSN 1979-7281 | e-ISSN 2443-1281

students. Therefore, the research hypothesis is that there is a positive relationship between knowledge of ecosystem concepts based on local wisdom and students' ecological behavior.

METHOD

Participants

The population in this research was selected using a multistage random sampling approach with several stages. The first stage used a purposive sampling technique to select high schools that had implemented local wisdom in biology learning and selected SMAN 97 in South Jakarta. The second stage determine the classes taken, namely 6 out of 8 classes X with 210 students using cluster random sampling. The third stage of determining the research sample used a simple random sampling technique and the selection of 168 students calculated using the Slovin formula.

Research Design and Procedures

This study used a quantitative descriptive approach. This study was carried out using regression and correlational analysis methods. there are two primary data obtained through knowledge of ecosystem concept based on local wisdom test score data and ecological behavior in the form of quantitative numbers for statistical analysis. This research refers to one independent variable and one dependent variable. The independent variable (X) is knowledge of ecosystem concept based on local wisdom, and the dependent variable (Y) is ecological behavior.

This research procedure begins with designing and developing a test of knowledge of ecosystem concepts based on local wisdom and ecological behavior questionnaires for students based on a predetermined conceptual framework. After that, the test is distributed to a randomly determined sample of students or through systematic selection. During the test-filling process, students are asked to answer questions about their knowledge of ecosystem concept based on local wisdom and ecological behavior to be measured. The collected data is then analyzed using statistical methods, such as descriptive analysis, to get an overview and inferential analysis to determine the influence between the variables studied.

Instrument

Sample collection in this study used a test instrument in the form of multiple-choice questions to measure students' local wisdom-based ecosystem concept knowledge, a non-test instrument in the form of a questionnaire to measure environmental sensitivity and ecological behavior. Multiple-choice questions to measure students' local wisdom-based ecosystem knowledge used the learning outcomes of the Independent Curriculum for Senior High School Class X and were developed based on aspects of knowledge proposed by Anderson & Krathwohl.

Before data collection was conducted, both instruments were first tested for validity and reliability. Validity testing was conducted both content-wise and empirically. Content validity testing was conducted by involving 2 experts from lecturers in the fields of education and biology. In addition to conducting content validity, this study conducted an empirical validity test involving 30 grade X students. Based on this test, it was stated that the local wisdom-based ecosystem knowledge and ecological behavior instruments used in this study were declared reliable with 35 valid local wisdom-based ecosystem knowledge test questions and 36 valid ecological behavior statements.

The instrument used to determine students' local wisdom-based ecosystem knowledge was created following the knowledge dimensions by Anderson & Krathwohl which were adjusted to the local wisdom of the local community. The instrument was in the form of a multiple-choice test with options a, b, c, d, and e. The instrument

was measured using a score of 1 for appropriate answers and 0 for inappropriate answers.

Data Analysis

Data analysis techniques used in this research are descriptive statistics and inferential statistics. Descriptive statistics are used to analyse data by describing or illustrating the data that has been collected as it is. Meanwhile, the use of inferential statistics allows researchers to provide descriptions and conclusions from the research data obtained. Inferential statistics includes two tests, namely analysis prerequisite tests and hypothesis tests. The prerequisite tests for analysis in inferential statistics include normality tests and homogeneity tests. After the prerequisite tests for analysis in this research have been fulfilled and meet all the requirements, the hypothesis testing technique used is multiple linear regression. Multiple linear regression analysis is a study of the dependence of a dependent variable (dependent variable) on one or more independent variables (independent variables) with the aim of estimating or predicting the average of the dependent variable based on the known values of the independent variables. After carrying out the multiple linear regression test using the F test, a multiple correlation test was carried out using the t test, then finally the coefficient of determination (R2) test to measure how far the model's ability is to explain variations in the dependent variable.

RESULTS AND DISCUSSION

Relationship between Ecosystem Concept Knowledge Based on Local Wisdom (X1) and Ecological Behavior (Y)

As for the data obtained from the results of simple linear regression analysis calculations on data X on Y, the constant a = 50.790 and the regression coefficient b = 0.394 were obtained (Table 1).

Table 1. Results of Calculation of Simple Linear Regression Model Between X1 and Y

	B	t	Sig.
Constant	50.790	17.825	.000
X1	.394	10.969	.000

Value of constant (a) has a positive value of 50.790, which means it shows the unidirectional influence of knowledge of ecosystem concept based on local wisdom on ecological behavior. This shows that if the variable for knowledge of ecosystem concept based on local wisdom is 0 percent or there is no change, then the value of ecological behavior is 50.790. The value of the regression coefficient for the knowledge of ecosystem concept based on local wisdom variable has a positive value of 0.394. This shows that if the variable of knowledge of ecosystem concept based on local wisdom increases by 1%, ecological behavior will also increase by 0.394. This shows that there is a unidirectional influence between the independent variable and the dependent variable. The equation of the simple linear regression model is $\acute{Y} = 50.790 + 0.394X1 + e$. Based on the results of the equation that has been obtained, it shows that if there is an additional 1 score in knowledge of ecosystem concept based on local wisdom, then the score for ecological behavior will increase by 0.394 at a constant of 50.790.

Table 2. Results of the Significance Test of the Simple Linear Regression Model Between X1 and Y

	Sum of Square	F	Sig.
Regression	4374.459	120.326	.000
Residu	6034.916		
Total	10409.375		

Results of the significance test of the regression model at a significance level of $\alpha = 0.05$ show that the Fcount produced in the test is 120.326, which is a value greater than the Ftable in this study which has a value of 3.04 with a significance value of obtained is 0.001, which means that the value is smaller than the significance level of (0.05) and means that H0

 | p-ISSN 1979-7281 | e-ISSN 2443-1281

is rejected. This shows that the knowledge of ecosystem concept based on local wisdom and ecological behavior using the simple linear regression model Ý = 50.790 + 0.394X1 + e is significant.

Correlation coefficient calculation uses the Pearson Product Moment formula. Based on Table 1, it is known that the correlation coefficient between knowledge of ecosystem concept based on local wisdom and ecological behavior is 0.648. This certainly illustrates the existence of a positive correlation with strong criteria.

Based on the hypothesis test of the research results, there is a positive relationship between knowledge of ecosystem concepts based on local wisdom (X1) and ecological behavior (Y), having a correlation with a strong category of 0.648. The statement by Masykuroh, Yetti, & Nurani (2024), states that environmental behavior is positively correlated with the level of individual knowledge of environmental problems. According to (Geiger et al., 2018). knowledge has an important effect on a person's behavior. Increasing environmental knowledge required as a requirement for ecological behavior is seen as a basic component of environmental education (Otto & Pensini, 2017). In line with the research of Osman, Jusoh, Amlus, & Khotob (2014), that knowledge is information from the process of interaction with the environment which, if increased, will lead to more responsible choices which in turn foster good behavior towards the environment. A person's knowledge of an object that is considered positive is likely to be applied in his life (Wang et al.,2021; Gkargkavouzi, Halkos, & Matsiori, 2019).

Students' knowledge and understanding of the environment is greatly dependent on the teaching situation and conditions in terms of delivering material at school. The use of appropriate methods and media by teachers can also make the learning atmosphere in the classroom less boring. In addition, students can expand their knowledge of the concept of ecosystems based on local wisdom with the help of various experiences from their studies, for example through practice or observation in the school environment. The Education for Sustainable Development (EfSD)-based module on the concept of ecosystems based on local wisdom is one of the media that can be used to improve students' knowledge of the concept of ecosystems based on local wisdom (Rahman, Heryanti, & Ekanara, 2019). The development of this module is intended for high school students in grade X and is suitable for implementation in Biology learning. Therefore, it is hoped that students will have knowledge and form positive behaviors towards the environment. In addition, research by Adam, Lameed, & Ayodele (2022), states that the 7E Learning Cycle Model has a significant influence on student achievement and learning retention in the concept of ecosystems based on local wisdom. The use of the 7E learning cycle model will significantly improve educational outcomes, especially in difficult concepts in biology.

The contribution given by the variable of knowledge of ecosystem concepts based on local wisdom to the ecological behavior of students is 42% while the remaining 58% is caused by other factors which needs to be studied in further research. So the more positive the knowledge of ecosystem concepts based on local wisdom of a student, the more positive the ecological behavior of the student. So that the relationship still provides an illustration of a positive relationship between X1 and Y.

Relationship between Environmental Sensitivity (X2) and Ecological Behavior (Y)

As for the data obtained from the results of simple linear regression analysis calculations on data X2 on Y, the constant a = 50.790 and the regression coefficient b = 0.394 were obtained (Table 3).

Table 3. Results of Calculation of Simple Linear Regression Model Between X2 and Y

	B	t	Sig.
Constant	37.345	9.435	.000
X2	.588	11.263	.000

Value of constant (a) has a positive value of 37.345, which means it shows a unidirectional influence between the environmental sensitivity variable and ecological behavior. This shows that if the environmental sensitivity variable is worth 0 percent or does not change, then the ecological behavior value is 37.345. Meanwhile, the regression coefficient value for the environmental sensitivity variable has a positive value of 0.588. This shows that if environmental sensitivity increases by 1%, then ecological behavior will increase by 0.588. A positive sign means that it shows a unidirectional influence between the independent variable and the dependent variable.

The equation of the simple linear regression model is $\hat{Y} = 37.345 + 0.588\ X2 + e$. The equation obtained shows that if there is an additional 1 score on environmental sensitivity, the ecological behavior score will increase by 0.588 at a constant of 37.345.

Table 4. Results of the Significance Test of the Simple Linear Regression Model Between X2 and Y

	Sum of Square	F	Sig.
Regression	4509.214	126.866	.000
Residu	5900.161		
Total	10409.375		

Results of the significance test of the regression model at a = 0.05 show that F count is 126.866 which is greater than F table which is 3.05 with a significance value of 0.000 < α (0.05) which means reject Ho. This shows that the simple regression model $\acute{Y} = 37.345 + 0.588X2 + e$ is significant.

The calculation of the correlation coefficient uses the Pearson Product Moment formula. The correlation coefficient value of 0.658 illustrates a positive correlation with strong criteria. The correlation results obtained a score of r-count value of 0.658> r-table value of 0.146. The significance value obtained is smaller than α, namely 0.000 <0.05 or t-count 15.681> t-table 1.973, which means that the higher the environmental sensitivity, the stronger the ecological behavior.

The level of environmental sensitivity of students is categorized as sufficient. This is because awareness in terms of protecting the environment is still at the stage of understanding and has not reached the stage of application (Cater, 2022). Therefore, it is necessary to take a persuasive approach to students to continue to be sensitive to the environment. Teachers can provide role models related to environmental sensitivity through simple methods such as helping to erase the blackboard after learning activities are over, inviting students to pick up scattered trash, being involved in community service programs in maintaining the preservation of the school environment, and reprimanding students who violate environmental preservation and giving appreciation or praise to students who preserve the environment.

This positive relationship explains that environmental sensitivity can support students' ecological behavior even though there are still other factors. In accordance with the statement of Cheng & Wu (2015), who conducted an investigation into environmental attitudes and behavior, it was found that the level of correlation between environmental sensitivity and behavior was moderate to strong.

The results of the regression equation in Table 4 show that there is a linear relationship between environmental sensitivity and students' ecological behavior. The better the environmental sensitivity, the better the students' environmental behavior (Gkargkavouzi et al., 2019). However, conversely, the lower the environmental sensitivity, the weaker the students' ecological

 | p-ISSN 1979-7281 | e-ISSN 2443-1281

behavior. The more positive the environmental sensitivity value, the stronger the students' views on the environment, in this case it will form a new perspective on the environment and become a behavior in life (Putri & Nikawanti, 2018).

Environmental sensitivity refers to a person's feelings about life experience which is related to interaction with the environment. The more life experience a person has, the more sensitive they will be to the state of their environment. Life experience related to the environment can be measured from a person's behavioral response to the state of the environment around them. There are several aspects that can influence changes in a person's attitude, including knowledge, additional information on environmental changes, interaction between individuals and their environment, and the purpose of the activities carried out (Cheng & Wu, 2015). The importance of environmental sensitivity is because the good and bad of the environment is also determined by the good and bad behavior of a person in that environment. The environment is one of the most important elements for humans, therefore the environment is not only a place for human activity, but also plays a very important role in supporting various human activities. The existence of these interactions shows that human behavior also has an impact on environmental conditions. How people interact with the environment affects the quality of life of the community (Sagiv & Schwartz, 2022).

The contribution given by the environmental sensitivity variable to the ecological behavior of students is 43.3% while the other 56.7% is caused by other factors which needs to be studied in further research. In other words, this relationship is able to provide an overview of the positive relationship between X2 and Y. Environmental sensitivity can provide a level of ecological behavior of students towards the environmental conditions around them so that students have a tendency to behave in solving various environmental problems around them well (Köse et al., 2011).

The relationship between knowledge of ecosystem concepts based on local wisdom (X1) and environmental sensitivity (X2) with ecological behavior (Y)

Before continuing with the linear regression and multiple correlation analysis, it is necessary to conduct a classical assumption test as a requirement for hypothesis testing in the multiple regression and correlation analysis.

Normality Test

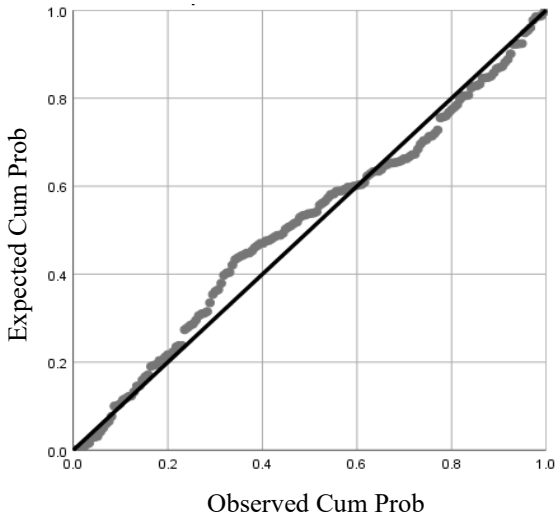

Figure 1. Probability Plot Normality Test

The regression model can be said to be normally distributed if the plotting data (dots) that describe the actual data follow the diagonal line. Based on the results obtained, the graph form in Figure 1 shows that the regression model is normally distributed.

Multicollinearity Test

Table 5. Multicollinearity Test

	B	Tolerance	VIF
Constant	30.326		
X2	.406	.781	1.280
X1	.588	.781	1.280

The tolerance value on the variable of knowledge of ecosystem concepts based on local wisdom (X1) is 0.781 > 0.100 and the

value of the increase in variance on the variable of knowledge of ecosystem concepts based on local wisdom (X1) is 1.280 < 10.00. Meanwhile, the tolerance value on the environmental sensitivity variable (X2) is 0.781 > 0.100 and the value of the increase in variance on the environmental sensitivity variable (X2) is 1.280 < 10.00. Based on Table 5, the results obtained from the multicollinearity test show that the data shows no symptoms of multicollinearity.

Heteroscedasticity Test

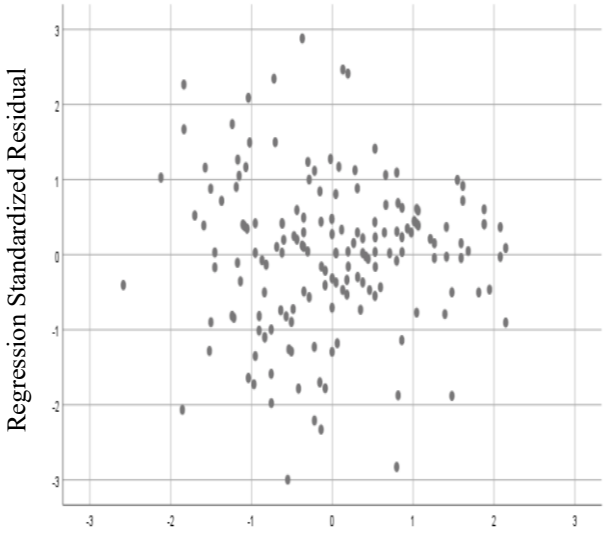

Figure 2. Scatterplots of Heteroscedasticity Test

The data does not show heteroscedasticity if there is no clear pattern in the scatterplot image (wavy, widening then narrowing) and the points are spread above and below the number 0 on the Y axis. Based on the results obtained from the heteroscedasticity test, the data shows no symptoms of heteroscedasticity in Figure 2.

Autocorrelation Test

Table 6. Autocorrelation Test

R	Std. Error	Durbin Watson
.763[a]	5.138	1.907

According to Ghozali (2011), there is no autocorrelation symptom if the Durbin Watson value is between du and (4-du). The du value is searched for in the distribution of Durbin Watson table values based on k (2) and N (168) with a significance of 5%. Based on the results obtained from SPSS ver 25, the data shows a du value (1.779) < Durbin Watson (1.907) < 4-du (2.221) which means there is no autocorrelation symptom.

Table 7. Results of Multiple Linear Regression Model Calculation Between X1, X2 and Y

	B	t	Sig.
Constant	30.326	8.585	.000
X2	.406	7.976	.000
X1	.436	7.649	.000

Value of Constant (a) has a positive value of 30.326. A positive sign means that it shows a unidirectional influence between the independent variable and the dependent variable. This shows that if all independent variables including knowledge of ecosystem concepts based on local wisdom (X1) and environmental sensitivity (X2) have a value of 0 percent or do not change, then the value of ecological behavior is 30.326. The regression coefficient value for the variable knowledge of ecosystem concepts based on local wisdom (X1) has a positive value of 0.265.

The equation obtained shows that if there is an additional 1 score on the knowledge of the ecosystem concept based on local wisdom, then the ecological behavior score will increase by 0.265 at a constant of 30.326. While if there is an additional 1 score on environmental sensitivity, then the ecological behavior score will increase by 0.406 at a constant of 30.326.

Table 8. Results of Multiple Linear Regression Significance Test of X1, X2 and Y

	Sum of Square	F	Sig.
Regression	6053.833	114.668	.000
Residu	4355.542		
Total	10409.375		

 | p-ISSN 1979-7281 | e-ISSN 2443-1281

Regression equation is tested F to determine the degree of significance in Table 10. Based on the significance value of the relationship between X1 and X2 simultaneously with Y in Table 8, namely 0.000 <0.05 and the F count value of 114.668> F table 3.05, it can be concluded that H3 is accepted, which means that there is a relationship between X1 and X2 simultaneously with Y. The test results listed can be concluded that the multiple regression model is very significant. This indicates a positive relationship between X1 and X2 simultaneously with Y, its truth has been tested.

The R square value is 0.582. This shows that knowledge of ecosystem concepts based on local wisdom and environmental sensitivity has an effect of 58.2% on ecological behavior. While the remaining 100%-58.2% = 41.8% is influenced by other variables or variables that are not studied. Therefore, the combination of the variables of knowledge of ecosystem concepts based on local wisdom and environmental sensitivity provides a greater contribution compared to the correlation value separately.

The results of this study indicate that although the environmental sensitivity of students and Biology learning have not been optimally absorbed, they are able to provide significant contributions with knowledge of ecosystem concepts based on local wisdom towards students' ecological behavior simultaneously (Cater, 2022). This illustrates that the ecological behavior of high school students requires attention from various parties, such as schools, communities and even the government.

Knowledge of the basic concept of ecosystems based on local wisdom plays a very important role in efforts to convey knowledge to humans individually or in society. The scope of this knowledge is broader regarding living things, nature and the surrounding environment, as well as the patterns of interaction formed between the two, the impacts caused by activities carried out by humans (Solihin & Dedah, 2022). So if this is owned by students, the environment will be more organized because of their concern for the environment. Ilhami et al., (2019) showed that increased knowledge does not always lead to changes in behavior, but knowledge is very important when given before someone takes action. Actions can be consistent with knowledge when someone gets a signal strong enough to motivate them to act based on their knowledge.

Knowledge not only includes knowledge of ecosystems and their components but the existence of knowledge can be used as a basis for being sensitive and having a sense of love for the surrounding environment. Knowledge and attitude have a positive relationship, because there is an encouragement of individual awareness in preserving an environment (Handayani et al., 2018). An individual with good knowledge of the environment, sensitivity and ecological behavior will also be useful in everyday life. However, when an individual shows good ecological sensitivity and behavior, it does not necessarily have good knowledge of their environment. Therefore, when applying ecological sensitivity and behavior to everyday life, this can be accustomed and applied early on in the family environment and in the school environment.

The improvement of students' ecological behavior can apply behaviorist learning theory and constructivist learning theory. These two theories were chosen because at least they have met the requirements of comparability, namely in terms of their objects, these theories have the same object, namely studying individual behavior in learning (Thondhlana & Hlatshwayo, 2018). The behaviorist view that considers learning to be a visible change in behavior, and can always be measured, the relationship between stimulus and response, is always opposed to the constructivist view where students build their knowledge through experience, so that the learning process is very

dynamic and centered on students (Utari et al., 2021).

One of the activities that can improve ecological behavior is that teachers can hold ecosystem practicums. Ecosystem practicums have the potential and strategic role in facing the era of globalization and industrialization. This potential is realized if practicum activities can equip students with creative thinking skills, logical thinking, problem solving, critical thinking, technological proficiency and adaptiveness to changes and developments in the era (Muchsin et al., 2023). This shows that ecosystem practicum activities can be supporting activities to increase knowledge of ecosystem concepts based on local wisdom, environmental sensitivity, and ecological behavior of students. (Casaló & Escario, 2018). The existence of a variety of ecosystem practicum activities can also increase in-depth study and use it to solve problems in everyday life (Solihin et al., 2020).

A study conducted by (Hamilton-Ekeke (2007), compared classes that taught ecosystems indoors with classes that were taught partly in the field. The results of the study showed that fieldwork is an important aspect of learning about ecosystems in secondary schools. Students who had direct experience in the field scored higher on a multiple-choice test in ecology. In addition, another study by Mailani et al., (2021) compared elementary school students' understanding of ecosystems where one group was taught traditionally indoors and one group learned about ecosystems during a field trip at a field center. The group that attended the field trip showed a better understanding of ecosystems based on both multiple-choice and open-ended questions. Other results showed that these students also scored higher on positive attitudes toward biology.

In line with the principles proposed by the Ecology Center (2015), knowledge of local wisdom and ecosystems will produce ecological behavior. In this case, when the dynamism between the two has been achieved, it will produce a healthy, prosperous, and able to live human lifestyle in the 21st century in maintaining the balance of the ecosystem.

CONCLUSION

Based on the study results, it can be concluded that knowledge of ecosystem concepts based on local wisdom has a positive and strong relationship with ecological behavior. These results highlight the ecosystem concept plays a role as a foundation of knowledge in order to form students who understand environmental sustainability. So if you want to improve ecological behavior, it is necessary to consider improving the knowledge of ecosystem concepts based on local wisdom of students.

The broader implications suggest that knowledge of ecosystem concepts based on local wisdom can support educational goals that are in line with the theme of the Pancasila student profile strengthening project of the independent curriculum so that it can help solve contemporary problems such as climate change, environmental degradation and food crises. To strengthen ecological behavior, practical recommendations that can be applied are that teachers can invite students to participate in environmental conservation activities both outside and inside schools.

ACKNOWLEDGMENT

Thanks are given to the principal of SMA Negeri 97 Jakarta who has given permission for this research to be conducted. To the Biology teacher of class X IPA of SMA Negeri 97 Jakarta and to all students of class XII IPA as the subjects of the research

REFERENCES

Adam, A., Lameed, U., & Ayodele, S. (2022). Attaining meaningful learning of ecological concept: A test of the efficacy of 7e learning cycle model. *Int J Educational Research,* 04, 18-29. https://doi.org/10.5281/zenodo.6790327

 | p-ISSN 1979-7281 | e-ISSN 2443-1281

Ajzen, I., Joyce, N., Sheikh, S., & Cote, N. G. (2011). Knowledge and the prediction of behavior: The role of information accuracy in the theory of planned behavior. *Basic and Applied Social Psychology,* 33(2), 101-117. https://doi.org/10.1080/01973533.2011.568834

Aman, A. H. L., Harun, A., & Hussein, Z. (2012). The Influence of environmental knowledge and concern on green purchase intention the role of attitude as a mediating variable. *British Journal of Arts and Social Sciences,* 7(2), 145- 167. http://www.bjournal.co.uk/BJASS.aspx

Azadi, Y., Yazdanpanah, M., Mahmoudi, H. (2019). Understanding smallholder farmers' adaptation behaviors through climate change beliefs, risk perception, trust, and psychological distance: evidence from wheat growers in Iran. *J. Environ. Manag*. 250, 109456. https://doi.org/10.1016/j.jenvman.2019.109456

Bahagia, Muniroh, L, Wibowo, R & Ritzkal. (2023). Kondisi Pengetahuan Kearifan Lokal Pemuda Pada Sekolah Menengah Kejuruan Madani Desa Urug Kabupaten Bogor. *Risalah, Jurnal Pendidikan Dan Studi Islam*, 9 (1):177-87. https://doi.org/10.31943/jurnal_risalah.v9i1.419

Budiarta, Wayan. (2023). Integrasi Kearifan Lokal Mulat Sarira dalam Pembelajaran Sejarah. *Journal Ikatan Keluarga Alumni Undiksha*. Vol. 21(1) PP. 1-7. https://doi.org/10.23887/ika.v21i1.40848

Casalo, L.V., Escario, J.J., (2018). Heterogeneity in the association between environmental attitudes and pro-environmental behavior: a multilevel regression approach. *J. Clean. Prod.* 175, 155e163. http://dx.doi.org/10.1016/j.jclepro.2017.11.237

Cater, K. (2021). The Benefits and Challenges of Environmental Sensitivity for Postsecondary Learners: Implications for Education Policy, Practice and Institutions *(Dissertation, University of the Sunshine Coast)* University of the Sunshine Coast, Queensland. https://doi.org/10.25907/00122

Çokadar, H., & Yılmaz, G. C. (2010). Teaching ecosystems and matter cycles with creative drama activities. *Journal of Science Education and Technology*, 19(1), 80-89. https://doi.org/10.1007/s10956-009-9181-3

Constantinus, Lako & Haryanti. (2021). A Study of Local Wisdom, Social Interest, and Pro Environmental Behavior in Improving Environmental Leadership Performance. *Journal of Southwest Jiaotong University*, 56 (6). http://dx.doi.org/10.35741/issn.0258-2724.56.5.25

Dornhoff, M., Sothmann, J.N., Fiebelkorn, F., Menzel, S., (2019). Nature relatedness and environmental concern of young people in Ecuador and Germany. *Front. Psychol.* 10, 453. https://doi.org/10.3389/fpsyg.2019.00453

Firdaus, A., Lestari, F., Afiff, S.A. & Herdiansyah, H. (2023). Integration of knowledge and local wisdom for disaster resilience in Anak Krakatau volcano. *Jàmbá: Journal of Disaster Risk Studies* 15(1). 1457 https://doi.org/10.4102/jamba.v15i1.1457

Geiger, S. M., Otto, S., & Schrader, U. (2018). Mindfully green and healthy: an indirect path from mindfulness to ecological behavior. *Frontiers in Psychology,* 8 (2306), 1-11. https://doi.org/10.3389/fpsyg.2017.02306.

Geiger, S.M., Geiger, M., & Wilhelm, O. (2019). Environment-Specific vs. General Knowledge and Their Role in Pro-environmental Behavior. *Front. Psychol.* 10:718. https://doi.org/10.3389/fpsyg.2019.00718

Gkargkavouzi, A., Halkos, G., & Matsiori, S. (2019). Environmental behavior in a private-sphere context: Integrating theories of planned behavior and value

belief norm, self-identity and habit. *Resources, Conservation and becycling*, 148, 145-156. https://doi.org/10.1016/j.resconrec.2019.01.039

Gurbuz, I. B., & Ozkan, G. (2019). What's Going on at the Universities? How Much has the Research Revealed University Students' Attitudes Towards the Environment? A Case Study of Bursa, Turkey. *Applied Ecology and Environmental Research*, 17(2). 5109-5138 http://dx.doi.org/10.15666/aeer/1702_51095138

Hamilton-Ekeke, J. T. (2007). Relative effectiveness of expository and field trip methods of teaching on students' achievement in ecology. International *Journal of Science Education,* 29(15), 1869-1889. https://doi.org/10.1080/09500690601101664

Hasyim, A. W. (2013). Ecological behavior intention: The role of ecological sciences, ecological value and pro-environmental identity. *Journal of Business and Management*, www.iosrjournals.orgwww.iosrjournals.org

Hynes, N & Wilson, J. (2016). I do it, but don't tell anyone! Personal values, personal and social norms: can social media play a role in changing pro-environmental behaviors? *Technol. Forecast. Soc. Chang.* 111, 349–359. https://doi.org/10.1016/j.techfore.2016.06.034

Ilhami, A & Riandi. (2019). A Profile Of Biology And Science Teacher's Knowledge About Local Wisdom Ikan Larangan In West Sumatera. *Pupil: International Journal Of Teaching, Education And Learning,* 3 (1). http://dx.doi.org/10.20319/pijtel.2019.31.173180

Ipikasari., Sigit, D.V., & Komala R. (2020) The effect of knowledge of ecological concepts and intention to act toward responsible environmental behavior of senior high school students. *International Journal for educational and vocational studies (IJEVS),* 2(7) https://doi.org/10.29103/ijevs.v2i7.2754

Jena, L.K., & Behera, B. (2017). Environmental crisis and human well-being: A review. *International Journal of Development and Sustainability,* 6 (8), 561-574. www.Isdsnet.com/ijds

Kaiser, F. G., Oerke, B., & Bogner, F. X. (2007). Behavior-based environmental attitude: Development of an instrument for adolescents. *Journal of Environmental.* 27(3), 242–251, https://doi.org/10.1016/j.jenvp.2007.06.004.

Kaasa, A. (2021). Merging Hofstede, Schwartz, and Inglehart into a single system. *J. Cross-Cult. Psychol*, 52 (40). https://doi.org/10.1177/00220221211011244

Kusnadi. (2022). Merdeka Belajar Untuk Menumbuhkan Kearifan Lokal: Suatu Proses Pembelajaran Memperkuat Pilar Pendidikan. *Prosiding Temu Ilmiah Nasional Guru XIV*.

Lange, F., Dewitte, S. (2019). Measuring pro-environmental behavior: review and recommendations. *J. Environ. Psychol.* 63, 92e100 http://dx.doi.org/10.1016/j.jenvp.2019.04.009

Li., Ding., Luman, Zhao., Shuang, Ma., Shuai, Shaoe., Lixiao, Zhang. (2019). What influences an individual's pro-environmental behavior? A literature review. *Resources, Conservation & Recycling,* 146, 28–34 https://doi.org/10.1016/j.resconrec.2019.03.024

Mahaswa, R. Kala. (2019). Status Manusia Dalam Antroposen. *Jurnal Cogito*, 5 (2). 93-108 https://philarchive.org/rec/MAHSMD

Masykuroh, K., Yetti, E., Nurani, Y. (2024). Parents' Environmental Literacy: From Knowledge To Pro-Environmental Behavior. *Journal Of Law And Sustainable Development,* 12 (1) https://doi.org/10.55908/sdgs.v12i1.3197

 | p-ISSN 1979-7281 | e-ISSN 2443-1281

Mailani, Elvi., *et al*. (2021). Upaya Meningkatkan Cinta Kearifan Lokal Terhadap Peserta didik Sekolah Dasar Melalui Pendampingan Media Machine Question Answer And Appreciation Pada Pembelajaran Ips Di Sd Negeri 105293 Medan Estate.. *Guru Kita,* 5 (4). https://doi.org/10.24114/jgk.v5i4.28166

Muchsin, A., Sriyati, S., & Solihat, R. (2023). Identifikasi Indigenous Knowledge Suku Sasak Sebagai Upaya Pengembangan Pembelajaran Biologi Untuk Mendukung Konsep Merdeka Belajar. *Jurnal Paedagogy*, 10(2), 330-342. https://doi.org/10.33394/jp.v10i2.6875

Osman, N. H. Jusonmental Amlus, H. (2014). Exploring the relationship between environmental knowledge and environmental attitude towards pro-environmental behaviour: undergraduate business students perspective. *American-Eurasian Journal of Sustainable Agriculture,* 8(8), 1-4. https://www.researchgate.net/publication/266679531

Otto, S., & Pensini, P. (2017). Nature-based environmental education of children: Environmental knowledge and connectedness to nature, together, are related to ecological behaviour. *Global Environmental Change*, 47, 88-94. https://doi.org/10.1016/j.gloenvcha.2017.09.009

Pahlevy, A.R., Dewi, N.K., Alimah S. (2022). Analysis of Teachers' Perceptions on the Values of Local Wisdom in the Implementation of Biology Learning. *Journal of Innovative Science Education (JISE),* 11 (2) : 235–240. https://doi.org/10.15294/jise.v10i1.53866

Puspitaningrum, R., Yatimah, D., Samadi, S., Muthmainnah, Z., Aldeirre, D., & Solihin, S. (2018). Effect of Coral Reef Conservation Education on Students' Social Sensitivity (A Co-Curricular Learning Experimental Study at SMKN 61 Jakarta Pulo Tidung Besar Regency, Kepulauan Seribu). *AIP Conference Proceedings,* 1–8. Malang: American Institute of Physics Publishing. http://dx.doi.org/10.1063/1.5061890

Rahman, A., Heryanti, L. M., & Ekanara, B. (2019). Pengembangan modul education berbasis education for sustainable development pada konsep ekologi untuk siswa kelas x SMA. *Jurnal Eksakta Pendidikan (JEP),* 3(1), 87-98 https://doi.org/10.24036/jep/vol3-iss1/273

Sagiv, L & Schwartz, S.H. (2022). Personal Values Across Cultures. *Annu. Rev. Psychol,* 73, 517–546. https://doi.org/10.1146/annurev-psych-020821-125100

Setiawan, Agus. (2022). Keanekaragaman Hayati Indonesia: Masalah dan Upaya Konservasinya. *Indonesian Journal of Conservation* 11(1), 13-21. https://doi.org/10.15294/ijc.v11i1.34532

Singh V, Shukla S, Singh A. (2021) The principal factors responsible for biodiversity loss. *Open J Plant Sci*, 6(1): 011-014. https://dx.doi.org/10.17352/jps.000026

Solihin, S.D., Vivanti, M. Mieke. (2020). Relationship between Ecosystem Knowledge and Locus of Control with Intention to Act in MAN on Environment of Sukabumi District. *IJEV*. 1(1): 1-6. https://doi.org/10.29103/ijevs.v2i4.2529

Solihin & Dedah. (2022). Analisis Intention to act dan Motivasi Belajar Siswa Pasca Praktikum Isolasi DNA Sederhana menggunakan Alat dan Bahan Dapur. *BIOSFER.* 7(2). https://doi.org/10.23969/biosfer.v7i2.6531

Suwardi & Rahmawati, S. (2019). Pengaruh Nilai-Nilai Kearifan Lokal Terhadap Pola Pengasuhan Anak Usia Dini (AUD. *Jurnal AL-AZHAR INDONESIA SERI HUMANIORA*, 5 (2). http://dx.doi.org/10.36722/sh.v5i2.347

Sufyadi, S., Harjatanaya, T. Y., Adiprima, P., Satria, M. R., Andiarti, A., & Herutami, I. (2021). Panduan Pengembangan Projek Penguatan Profil Pelajar

Pancasila. https://repositori.kemdikbud.go.id/24964/

Suhendar, S. & Solihat, R. (2023). Profile of ecological practicum, logical thinking. and system thinking pre-service biology teacher. *Biosfer,* 16(1), 100-111. https://doi.org/10.21009/biosferjpb.27114

Suwardi & Rahmawati, S. (2019). Pengaruh Nilai-Nilai Kearifan Lokal Terhadap Pola Pengasuhan Anak Usia Dini (AUD. *Jurnal AL-AZHAR INDONESIA SERI HUMANIORA*, 5 (2). http://dx.doi.org/10.36722/sh.v5i2.347

Thondhlana, G., Hlatshwayo, T.N., (2018). Pro-environmental behaviour in student residences at Rhodes University, South Africa. *Sustainability* 10, 2746 https://doi.org/10.3390/su10082746

Utari, F. R. Noor, Rusmadi & Achmad, C. Adib. (2021). Nilai Konservasi Biodiversitas pada Masyarakat Dayak Kenyah Umo' Longh Malinau Kalimantan Utara sebagai Etnopedagogi Pembelajaran Biologi. *Bioeduca: Journal of Biology* Education, 3, (1). 71-81 https://doi.org/10.21580/bioeduca.v3i1.7523

Wang, J., Wang, S., Wang, H., Zhang, Z., & Ru, X. (2021). Examining when and how perceived sustainabilityrelated climate influences pro-environmental behaviors of tourism destination residents in China. *Journal of Hospitality and Tourism Management,* 48, 357–367. https://10.1016/j.jhtm.2021.07.008

 | p-ISSN 1979-7281 | e-ISSN 2443-1281