International JOURNAL OF SCIENCE AND EDUCATION
Website: https://journals.pspmas.org/index.php/ijose

THE INFLUENCE OF FAMILY LEGUMINOSAE ENVIRONMENT-BASED LEARNING ON STUDENTS' ENVIRONMENTAL AWARENESS VALUES AT THE LE HU GARDEN

Zikir Amin Nazara
UISU, Indonesia
Email: zikirnazara@gmail.com

Article Information:
Accepted (24 Mei 2024)
Published (10 Feb 2025)

Keywords:
Environmental Care Values, Environmental-Based Learning Methods

ABSTRACT

THE EFFECT OF LEGUMINOSAE FAMILY ENVIRONMENT-BASED LEARNING ON STUDENTS' ENVIRONMENTAL CARE VALUES AT THE LE HU GARDEN

This study aims to determine the effect of Leguminosae family environment-based learning on the environmental care values of BIOLOGY Education students, FKIP UISU at The Le Hu Garden. This research was conducted on May 7, 2024 at The Le Hu Garden.

This study uses a quasi-experimental method with the research population being all active BIOLOGY Education students, FKIP UISU, totaling 32 people who were then used as a sample in the form of a total sample that had the same number as the population, namely 32 people. The instrument in this study was an environmental care value test in the form of an initial test and post-test, observation sheets, and also a questionnaire sheet.

The results of the environmental care test of students before using this environment-based learning method obtained a sufficient value in mastery according to the classification of the environmental care value percentage index, which was 0 people (0%) and was classified as having very poor mastery, as many as 32 people (100%) with an average value of 23.19% and a standard deviation of 9.80, while the environmental care value test of students using the environment-based learning method was 2 people (9.5%) and was classified as sufficient, namely 16 people (76.1%) and those who were very poor were 3 people (14.2%) with an average value of 27.50 and a standard deviation of 63.47. The results of the normality test obtained L_count < L_table, which is 0.147 < 0.156, it is stated that the data is normally distributed, while the results of the homogeneity test obtained F_count < F_table, which is 1.48 < 1.56, it is stated that the data has the same variance or is homogeneous. The results of the hypothesis test using the t test obtained t_(count>) t_table or 25.50> 1.72 with a reality level of 0.05, so Ha is accepted and Ho is rejected. Thus, it can be concluded that there is a significant influence on the use of environmental-based learning methods for BIOLOGY education students, FKIP UISU MEDAN.

Keywords: Environmental Care Values, Environmental-Based Learning Methods

INTRODUCTION

Indonesia is a country with very high biodiversity, both in flora and fauna groups, so Indonesia is nicknamed the "Megabiodiversity" country. The flora group has high diversity so that it always provides space for continuous study. This can be done continuously starting from the provincial, district to sub-district levels. Like one of the provinces in Indonesia, namely North Sumatra.

North Sumatra Province has a total area of approximately 182,414.25 km² consisting of a land area of approximately 72,981.23 km² and an ocean area of approximately 109,433.02 km². North Sumatra Province borders the Aceh region to the north, the Indian Ocean to the west, the Riau Province and West Sumatra Province to the south, while the Malacca Strait to the east. North Sumatra Province is one of the provinces located on the island of Sumatra. North Sumatra Province is located at 1° - 4° North Latitude and 98 ° - 100 ° East Longitude. North Sumatra Province has 213 islands that already have names, with 6 islands in the East Coast region including Berhala Island as the outermost island bordering the Malacca Strait and the remaining

207 islands in the West Coast region with Wunga Island and Simuk Island as the outermost islands in the West Coast region. Regionally, in its geographical position, North Sumatra Province is located on the strategic route of the Malacca Strait International shipping which is close to Singapore, Malaysia and Thailand. One of the tourist parks in North Sumatra is The Le Hu Garden Area located in Deli Serdang Regency, Deli Tua District. The Le Hu Garden is one of the parks that is currently an area with quite a lot of flora. The Le Hu Garden tourist park was established in 2015 as an alternative to fulfilling the need for recreation and tourism. The Le Hu Garden is a 3 hectare tourist location consisting of 3 plain zones, namely the first plain zone which is an artificial lake and fish pond, the second and third plains are hill areas with flower gardens on top. The park here is not just one, but there are several with different design and decoration ideas. The Le Hu Garden is generally located on Jl. Education, West Deli Tua, Deli Tua District, Deli Serdang Regency, North Sumatra. The Le Hu Garden is one of the tourist parks in North Sumatra which is rich in flora, especially the Leguminosae Family

International JOURNAL OF SCIENCE AND EDUCATION
Website: https://journals.pspmas.org/index.php/ijose

The Leguminosae Family is known as Fabaceae. In the world of agriculture, plants from this tribe are often referred to as Leguminosae Plants (Leguminosae) (Rohrig et al., 2013). This tribe is the third largest tribe of flowering plants after the Orchidaceae Asteracea Compositae tribe. The Leguminosae tribe has a habitus of liana bushes, shrubs, trees and a small part is aquatic plants. This plant is classified into the Angiospermae division or plants that have flowers. This family is estimated to have around 730 genera and 19,400 species with the largest genus being Astragalus (having more than 2000 species), then Acacia (more than 900 species), then Indigofera (more than 700 species), then Crotalaria (600 species), and finally Mimosa (500 species). Leguminosae itself is grouped into 3 subfamilies namely Mimosoideae, Caesalpinioideae and Papilionoideae. The Leguminosae Family (Fabaceae) is one of the riches of biodiversity in Indonesia. (Irsyam & Priyanti, 2016) The Leguminosae Family is a member of the Fabales nation which is characterized by pod-type fruit. It has a diverse body shape, ranging from herbs, shrubs, lianas to trees. Most of its tree and liana members have flowers with beautiful shapes and colors, such as Cassia sp, Erythrina sp, Mucunano voguineensis Scheff and Strongy lodonmacrobotrys A.Gray. Leguminosae has various uses, from seeds, fruits (pods), flowers, bark, stems, leaves, tubers, to roots used by humans. Food ingredients, drinks, cooking spices, dyes, green fertilizers, animal feed, medicinal materials, to poisons are produced by its members. Members of this tribe are also known for their ability to bind (fix) nitrogen directly from the air (not through soil fluids) because they are symbiotic with certain bacteria in their roots or stems. The tissue containing these symbiotic bacteria usually swells and forms nodules. Each type usually also has a symbiosis with a unique type of bacteria. Therefore, it is necessary to carry out the initial stages of research which can be called identification (Rohrig et al., 2013). According to the Republic of Indonesia Law Number 20 of 2003 concerning the National Education System, learning is a process of interaction between educators and students and learning resources that takes place in a learning environment.

Learning model is a learning model that can be interpreted as a plan or pattern used in compiling the curriculum, organizing student materials, and providing instructions to teachers in class and in teaching plans (II, 2020). In this explanation, it can be concluded that the learning model is a plan that is used as a guideline in planning learning and can help students obtain information.

According to (Nugrawiyati, 2015) environmental-based learning is learning that makes the environment a topic or learning material and can be a medium in learning. In other words, environmental-based learning is a learning process outside the classroom that uses objects as tools to gain real experience, observe directly, obtain data accurately and can learn independently or in groups.

The environment as a learning resource can be optimized in the learning process to enrich the materials and learning activities of students at school. Because the relationship between students and the environment is a relationship that influences each other so that there is an understanding related to the material being studied. Environmental-based learning is realized by displaying examples of the application of Biology Education subject matter in everyday life that exist in the environment.

Caring for the environment is an attitude and action that always tries to prevent damage to the surrounding natural environment, and develops efforts to repair the damage to nature that has occurred (Ismail, 2021). This attitude needs to be formed into a good habit for the younger generation (Ismail, 2021) However, the low attitude and concern of students towards the environment is certainly concerning, because through education students should understand and care more about their environment. In reality, there are still many who damage the environment without knowing the consequences of environmental damage. In order to teach environmental education and instill an attitude of caring for the environment in students, an environmental-based learning method is needed to emphasize and improve students' environmental attitudes.

METHODS

A. Location and Time of Research

1. Research Location

The research was conducted at The Le Hu Garden, Delitua District, Deli Serdang Regency, North Sumatra Province, 10.1 km from Medan City, with an area of 3 hectares. Then it was applied at the Islamic University of North Sumatra on Jalan Sisingamangaraja, Teladan Village, Medan City, Teladan Barat,

Medan City, Medan City, North Sumatra 20216 on Biology Education Students of FKIP UISU who were active in the 2023/2024 academic year.

2. Research Time

This research lasted for 3 months from March to May 2024.

B. Population and Sample

1. Research Population

The population in this study were all Biology Education students of FKIP UISU who were active in the 2023/2024 academic year.

Table of Population of All Biology Education Students FKIP UISU

NO	Class	Man	Woman	Amount
1	Semester 2	-	2 Student	2 Student
2	Semester 4	1 Student	7 Student	8 Student
3	Semester 6	-	3 Student	3 Student
4	Semester 8	3 Student	17 Student	20 Student
Jumlah		4 Student	29 Student	33 Student

Source: Faculty of Teacher Training and Education

2. Research Sample

The sample used in this study was total sampling, a sampling technique where the number of samples is the same as the population. The sample in this study were all Biology Education students of FKIP UISU who were active in the 2023/2024 academic year.

C. Research Variables

1. Variabel Bebas (N)

The independent variable in the study is environment-based learning activities.

2. Variabel terikat (Y)

The dependent variable in this study is the environmental concern value of students towards the Leguminosae Family at The Le Hu Garden.

D. Research Methods and Design

1. **Research Methods**

This type of research is a quasi-experiment (Quasi Experiment), namely research that is intended to determine whether or not there is an effect of something imposed on the subject, namely students. (Zaini Miftach, 2018b) the experimental research method is a research method used to find the effect of something that is treated on others in conditions that can be controlled. Quasi experiments use all subjects in the study group (intact group) to be treated, not using subjects taken randomly.

2. **Research Design**

The research design carried out by this researcher is as shown in the table below

Class	Initial Test	Treatment	Final Test
Sample Class	T1	environment based	T2

Description =
T1 = Initial Test Administration (To see students' abilities in environmental-based learning)
Environment-Based = Treatment given to the sample during the research
T2 = Final Test Administration (To see students' environmental awareness values)

International JOURNAL OF SCIENCE AND EDUCATION
Website: https://journals.pspmas.org/index.php/ijose

RESULTS AND DISCUSSION

A. Results

The research data were obtained from the results of the initial test and post-test and observation sheets on the material of Plant Morphology. The data were calculated to determine the effect of the Environmental-Based learning method on students' environmental awareness scores. In the assessment of essay test questions, students were declared successful if the students' environmental awareness scores were equal to or higher than 76 - 85% which was in accordance with the scoring indicators. The student observation sheet was declared successful if the average score percentage was 80% ≤ NR <90%.Kriteria Taraf Keberhasilan

90% ≤ NR ≤ 100% = Very Good
80% ≤ NR < 90% = Good
70% ≤ NR < 80% = Sufficient
60% ≤ NR < 70% = Poor
0% ≤ NR < 60% = Very Poor

From the results of the study conducted using the Environmental-Based learning method on the Leguminosae Family material for active Biology Education students of FKIP UISU in the 2023/2024 academic year with a total of 10 essay questions (items) for the initial test and 10 questions for the post-test, the following data were obtained =

Initial Test Results Data Table on Leguminosae Family Material with minimum scoring criteria of 76 – 85%

No	Student name	Initial Test		Information
		Score	Value	
1	Wasihatul Afrah	7	23,33	Less than once
2	Luthfia Indaru	9	30,00	Less than once
3	Della Amanda Putri	12	40,00	Less than once
4	Asrina Hasibuan	11	36,66	Less than once
5	Farida Alas	6	20,00	Less than once
6	Amanda Bako	11	36,66	Less than once
7	Suranta Uli Br Ginting	9	30,00	Less than once
8	Khofifah Intan Maharani	11	36,66	Less than once
9	Riska Rahma Putri	11	36,66	Less than once
10	Veronika	4	13,33	Less than once
11	Yusi Salsabila	4	13,33	Less than once
12	Hafizah Khairani	3	10,00	Less than once
13	Mila Ariska Dewi	6	20,00	Less than once
14	Indah Meliana	10	33,33	Less than once
15	Muhamad Ekbal Awaludin	7	23,33	Less than once
16	Dhiya Azhari Pangaribuan	5	16,66	Less than once
17	Dini Rafika	8	26,66	Less than once
18	Yusra Laila	8	26,66	Less than once
19	Johan PH Pardosi	11	36,66	Less than once
20	Adzilla Saragih	6	20,00	Less than once
21	Dilla Anggreini	10	33,33	Less than once
22	Puput Amalia	5	16,66	Less than once
23	Musa Al Quddusi	9	30,00	Less than once
24	Ade Amalia	12	40,00	Less than once
25	Refina Ramadhani	6	20,00	Less than once

26	Riza Sibuea	7	23,33	Less than once
27	Dinda Vika Yulia Ningsih	8	26,66	Less than once
28	Theresia Sihaloho	6	20,00	Less than once
29	Mariana Ritonga	7	23,33	Less than once
30	Nazzwa Syalvina Hakim	7	23,33	Less than once
31	Rizka Khoirunisa	10	33,33	Less than once
32	Hafifah Anggraini	11	36,66	Less than once

From the data in the Initial Test Results Data Table on the Leguminosae Family Material with a minimum scoring criteria of 76 - 85% above, it was obtained from 5 indicators and each indicator consists of 2 questions, with the assessment as stated in the Environmental Care Value Scoring Guidelines Table.

Percentage of average value (NR) $= \frac{Total\ score}{Maximum\ score}\ x\ 100$ (Sudijno, 2008)

$$NR = \frac{7}{30}\ x\ 100 = 23{,}33$$

From the data of the Initial Test Result Data Table on the Leguminosae Family Material with a minimum scoring criteria of 76 - 85% above, it can be seen that the highest score of students in the initial test was 40 for 1 person and the lowest score was 10 for 1 person. The initial test scores of students who succeeded with a good level of mastery were according to the scoring indicators, namely 0 people (0%) and those who failed were 32 people (100%).

Post-Test Results Data Table on Leguminosae Family Material with minimum scoring criteria of 76 – 85%

No	Student name	Final Test		Information
		Score	Value	
1	Wasihatul Afrah	24	80,00	Good
2	Luthfia Indaru	12	40,00	Less than once
3	Della Amanda Putri	23	76,66	Enough
4	Asrina Hasibuan	12	40,00	Less than once
5	Farida Alas	20	66,66	Enough
6	Amanda Bako	16	53,33	Enough
7	Suranta Uli Br Ginting	22	73,33	Enough
8	Khofifah Intan Maharani	18	60,00	Enough
9	Riska Rahma Putri	23	76,66	Good
10	Veronika	23	76,66	Good
11	Yusi Salsabila	22	73,33	Enough
12	Hafizah Khairani	18	60,00	Enough
13	Mila Ariska Dewi	24	80,00	Good
14	Indah Meliana	15	50,00	Less than once
15	Muhamad Ekbal Awaludin	17	56,66	Enough
16	Dhiya Azhari Pangaribuan	21	70,00	Enough
17	Dini Rafika	12	40,00	Less than once
18	Yusra Laila	23	76,66	Good
19	Johan PH Pardosi	12	40,00	Less than once
20	Adzilla Saragih	20	66,66	Enough
21	Dilla Anggreini	19	63,33	Enough
22	Puput Amalia	18	60,00	Enough
23	Musa Al Quddusi	23	76,66	Good
24	Ade Amalia	20	66,66	Enough
25	Refina Ramadhani	21	70,00	Enough
26	Riza Sibuea	21	70,00	Enough

International JOURNAL OF SCIENCE AND EDUCATION
Website: https://journals.pspmas.org/index.php/ijose

27	Dinda Vika Yulia Ningsih	20	66,66	Enough
28	Theresia Sihaloho	24	80,00	Good
29	Mariana Ritonga	20	66,66	Enough
30	Nazzwa Syalvina Hakim	18	60,00	Enough
31	Rizka Khoirunisa	19	63,33	Enough
32	Hafifah Anggraini	19	63,33	Enough

From the data in the Post-Test Results Data Table on the Leguminosae Family Material with a minimum scoring criteria of 76 - 85% above, obtained from 5 indicators and each indicator consists of 2 questions, with the assessment as stated in the Environmental Care Value Scoring Guidelines Table

Percentage of average value (NR) $= \frac{Total\ score}{Maximum\ score}\ x\ 100$ (Sudijno, 2008)

$$NR = \frac{24}{30}\ x\ 100 = 80{,}00$$

From the Post Test Result Data on the Leguminosae Family Material with a minimum scoring criteria of 76 - 85% above, it is known that the highest score of students in the post test was 80.00 for 3 people and the lowest score was 40.00 for 4 people. The post test scores of students who succeeded with a good level of mastery according to the scoring indicators were 16 people (78.2%) and those who failed were 7 people (21.8%).

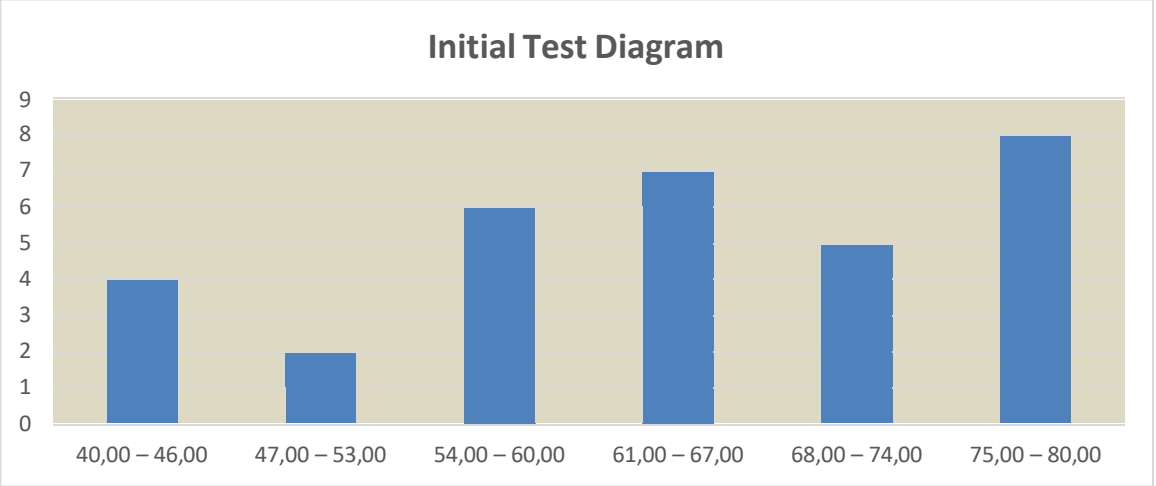
To find out the average standard deviation in the initial test and post test, it can be seen in the Frequency Distribution List Table of Students' Initial Test Scores and the Frequency Distribution List Table of Students' Post Test Scores below.

Frequency Distribution List Table of Students' Initial Test Scores

No	Test Scores	Fi	Xi	Xi2	Fi.Xi	Fi.Xi2
1	10,00 – 14,00	3	12,00	144	36	432
2	15,00 – 19,00	2	17,00	289	34	578
3	20,00 – 24,00	10	22,00	484	220	4840
4	25,00 – 29,00	3	27,00	729	81	2187
5	30,00 – 34,00	6	32,00	1024	192	6144
6	35,00 – 40,00	8	37,00	1369	296	10952
	Amount	32	147,00	4039	859	25133

Based on the Frequency Distribution List Table of Initial Test Scores of students above, to find the average value of the initial test, namely by dividing the total number of Student scores by (fixi) 859 with the frequency of the number of Students (fi) as many as 32 so that the average value of the initial test ($\bar{x}$) is 26.84 and the standard deviation is 8.17.

From the frequency distribution list of the initial test on the Leguminosae Family material using an environment-based learning model, it can be described in the frequency distribution graph below



Graphic Image of Initial Test Scores of Biology Education Faculty Students on Leguminosae Family Material

Frequency Distribution List Table of Post-test Scores of Students

No	test scores	Fi	Xi	Xi2	Fi.Xi	Fi.Xi2
1	40,00 – 46,00	4	43,00	1849	172	7396
2	47,00 – 53,00	2	50,00	2500	100	5000
3	54,00 – 60,00	6	57,00	3249	342	19494
4	61,00 – 67,00	7	64,00	4096	448	28672
5	68,00 – 74,00	5	71,00	5041	355	25205
6	75,00 – 80,00	8	77,00	5929	616	47432
	Amount	32	147,00	26703	2033	133199

Based on the Table of Frequency Distribution List of Post-test Values of students above to find the average post-test value, namely by dividing the total number of Student values by (fixi) 2033 with the frequency of the number of Students (fi) as many as 32 so that the average pre-test value ($\bar{x}$) is 63.53 and the standard deviation is 11.41. From the list of frequency distribution of the post-test on the Family Leguminosae material using an environment-based learning model, it can be described in the frequency distribution graph below

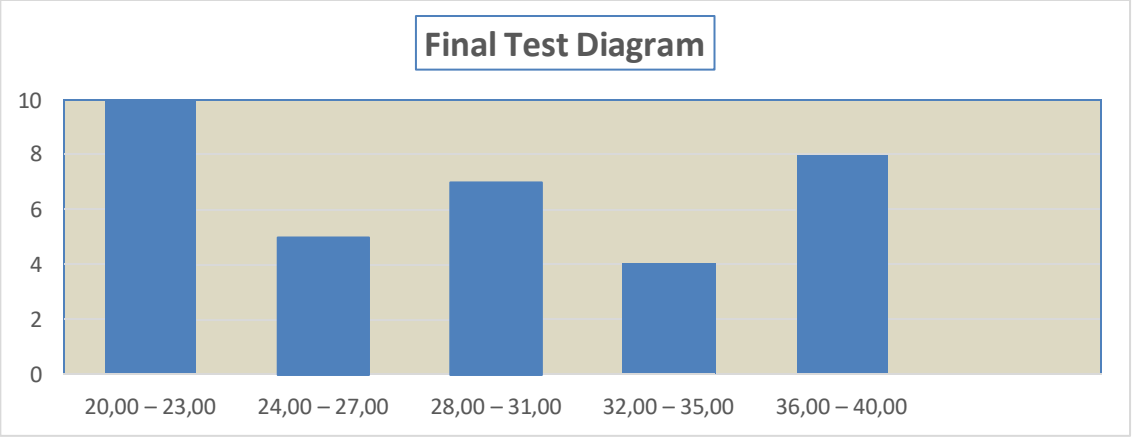


Figure . Post-Test Value Diagram of Biology Education Faculty Students on Leguminosae Family Material

Gain Value Data Table

No	Question Indicator	Gain
1	Understanding Leguminosae Family Plants	0,64
2	Maintaining environmental sustainability	0,32
3	Caring for Leguminosae family plants	0,46
4	Preventing environmental pollution	0,58
5	Understanding the role of plants in environmental sustainability	0,38

International JOURNAL OF SCIENCE AND EDUCATION
Website: https://journals.pspmas.org/index.php/ijose

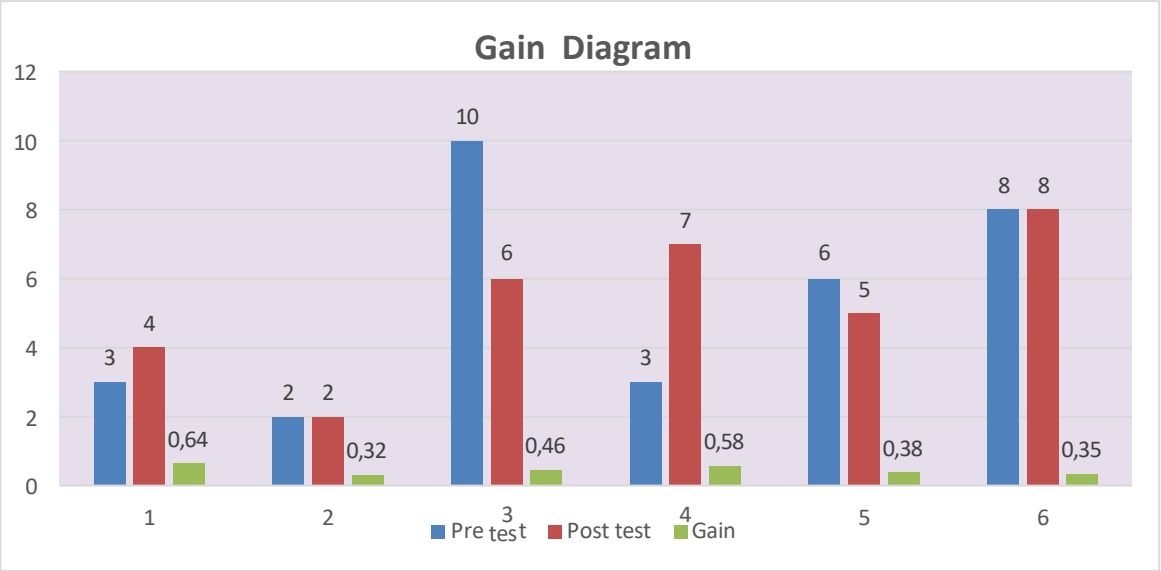
Based on the Gain Value Data Table above, the gain value data for students' environmental care values is assessed based on the gain score results. Each question indicator is compiled and its improvement score is calculated. To calculate the gain score results for each question indicator, the gain formula is obtained.

$$\text{Gain (g)} = \frac{S_{post} - S_{prest}}{S\,maks - S_{pre}}$$

$$= \frac{69-19}{96-19}$$

$$= \frac{50}{77} = 0{,}64 \quad \text{(Currently)}$$

From the list of Gain Value Data Tables on the Leguminosae Family material using the Environmentally Based learning model, it can be described in the frequency distribution graph below.



Gambar. Gain Increase Graph

Data Table of Presentation Values of Students' Environmental Care Values from Observation Sheets

Environmental Care Values	Indicator	Score Group 1					Score Group 2					Percentage of average value
		5	4	3	2	1	5	4	3	2	1	
Environmentally friendly attitude												
	Understanding Leguminosae Family Plants		4					4				80%
	Maintaining environmental sustainability	5						4				90%
	Caring for Leguminosae family plants			3				4				70%
	Preventing environmental pollution	5					5					100%
	Understanding the role of plants in environmental sustainability	5						4				90%

Based on the table of data on the presentation value of the average value of students' environmental concern through the observation sheet, it was obtained by adding up the total score divided by the maximum score multiplied by 100%.

Table. Questionnaire Data Calculation

No	Question	Answer options					Response	
		SS	S	RG	TS	STS	Positive Response (+)	Negative Response (-)
1	I find it easier to understand the learning if I am in the field directly	20	12				100%	
2	In studying plant morphology material, direct observation is required.	16	15	1			100%	
3	Observing is a basic thing that must be done in studying plant morphology.	13	15	1	3		90,63%	9,37%
4	I will note down everything I have observed.	15	13	4			100%	
5	I can know the effects of environmental pollution if I observe it directly.	17	10	3	1	1	93,75%	6,25%
6	I don't want to litter so that environmental pollution doesn't occur.	4	24	4			100%	
7	I will not remove plants because it is an effort to preserve plants.	12	14		3	1	87,5%	12,5%
8	I prefer an environment with lots of plants to an environment without plants.	9	19	4			100%	
9	The knowledge gained in plant morphology can be applied in life.	11	15	5		1	96,87%	3,13%
10	I am able to classify plant types without guidance from other people (experts).	13	11	3	2	3	84,38%	15,62%
11	I will ask the researcher if there is anything I don't know in the field.	18	10	4			100%	
12	I find it easier to understand the factors of environmental pollution	15	9	1	5	2	78,12%	21,88%
13	The knowledge gained in plant morphology can be applied in life.	14	14	2		2	93,75%	6,25%
14	I understand the consequences of destroying plants	16	13	3			100%	
15	I can understand the impact of environmental pollution	13	18	1			100%	
16	After this research, I will preserve the environment well	14	15	3			100%	
17	I can tell that the plant has economic value and sales value.	12	10	8	1	1	93,75%	6,25%
18	If I am asked, I can explain the results of my observations.	9	18		1	4	87,5%	12,5%
19	When my explanation is wrong, I am willing to accept input from others.	15	16	1			100%	
20	I will make my own conclusions about what I observe.	8	20	4			87,5%	12,5%

1. Test Data Requirements

Before the data is analyzed, data analysis requirements testing must first be carried out, including:

International JOURNAL OF SCIENCE AND EDUCATION
Website: https://journals.pspmas.org/index.php/ijose

a. Normality Test

The normality test is conducted to determine whether the data is normally distributed or not. This test is conducted using the Liliefors formula. Data is said to be normal if L_count < L_table at a significant level (α = 0.05).

Initial Test Data Normality Test

Initial Test Data Normality Test Table

Class interval	Xi	Frequency	Zi	F(zi)	S(zi)	[F (zi) – S (zi)]
10,00 – 14,00	12,00	3	-1,81	0,0321	0,1666	0,13456
15,00 – 19,00	17,00	2	-1,20	0,203	0,3333	0,1303
20,00 – 24,00	22,00	10	-0,59	0,396	0,5	0,104
25,00 – 29,00	27,00	3	0,01	0,550	0,6666	0,1166
30,00 – 34,00	32,00	6	0,63	0,701	0,8333	0,1323
35,00 – 40,00	37,00	8	1,24	0,853	1	0,147

$$\tilde{x} = 26.84, S = 8.17, L\_count = 0.1235, L\_table = 0.1566 \; The\ conclusion;\ L\_count > L\_table, then\ the\ initial\ test\ value\ data\ is\ normally\ distributed.$$

From the Initial Test Data Normality Test Table above to see the normality of the data taken from the largest L_{count} value of $F_{(zi)} - S_{(zi)}$, where the absolute price of the standard z is $L_{count} = 0.1235$ with a real level $= 0.05$ and $N = 32$ and obtained Ltable $= 0.1556$ from the calculation above proves $L_{count} < L_{table}$ which is 0.1235 $<$ 0.1556 so that it is stated that the initial test value data is normally distributed.

b. Post Test Data Normality Test

Post Test Data Normality Test Table

Class interval	Xi	Frequency	Zi	F(zi)	S(zi)	[F (zi) – S (zi)]
40,00 – 46,00	43,00	4	-1.79	,0321	0,1666	0,13456
47,00 – 53,00	,00	2	1,18	,203	0,3333	0,1303
54,00 – 60,00	57,00	6	0,56	,396	0,5	0,104
61,00 – 67,00	64,00	7	0,04	0,550	0,6666	0,1166
68,00 – 74,00	1,00	5	,65	0,701	0,8333	0,1323
75,00 – 80,00	77,00	8	1,18	0,853	1	0,147

$$\tilde{x} = 63.5, S = 11.41, L\_count = 0.147, Ltable = 0.156 \; Data\ L\_count < L\_table, = 0.147 < 0.156, then\ the\ post-test\ value\ data\ is\ normally\ distributed.$$

From Table 18 above to see the normality of the data is the same as in the initial normality test which is taken from $-\ S\_((zi))$, where the absolute price of the standard z is L_count $= 0.147$ with a real level $= 0.05$ and $N = 32$ and obtained Ltable $= 0.156$ from the calculation above proves L_count $<$ L_table which is 0.147 $<$ 0.156 so that it is stated that the post − test value data is normally distributed.

a. Homogeneity Test

Homogeneity Test is conducted to determine whether the population has homogeneous variance or not. Data is said to be homogeneous if Fcount <Ftable at a significant level of u = 0.05 From the data, it is known that the Initial Test variance (S^2) = 73.96 and the post-test variance (S^2) = 110.16, then Fcount = 1.48 is obtained

From the F distribution list, the F value for a = 0.05 dl numerator (V) = (n - 1) = (32-1 = 20) dk denominator (V) - (n - 1) - (32 - 1 = 20) So that Ftable 1.56 is obtained Because Fcount <Ftable or 1.48 <1.56, it can be stated that the

data presented has homogeneous variance.

1. Hypothesis Testing

According to (Nurmala, 2021) Hypothesis is a very general final statement that serves to explain various phenomena related to it. This hypothesis is then tested empirically by collecting data and evidence to prove or reject it

Based on the results of the calculations that have been carried out, it is known that the number of squares of deviations is 12,290.687 by using this value it can be known that it is 10.34. The t_count value> t_table or 10.34> 1.69. then Ha is accepted and Ho is rejected, so it is stated that There is a significant influence of environmental-based learning on the environmental care values of FKIP UISU students at The Le Hu Garden

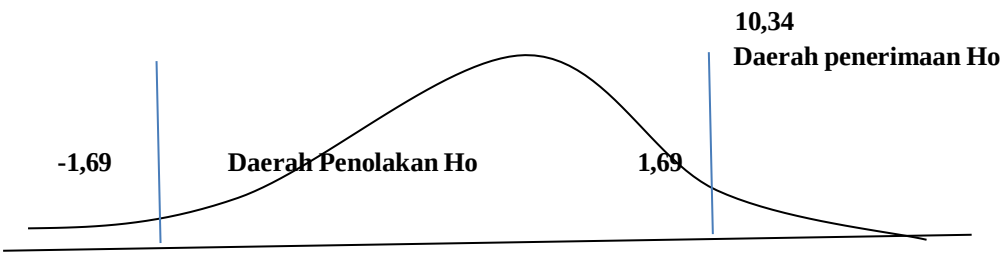


Figure. Hypothesis Testing Curve

According to Dantes (2012) a hypothesis is a presumption or assumption that must be tested through data or facts obtained through research. According to Sugiyono (2009) a hypothesis is a temporary answer to the formulation of a research problem, where the formulation of the research problem has been stated in the form of a question. The hypothesis is said to be temporary because the answer given is only based on theory. Borg and Gall (1979: 61) proposed the following requirements for a hypothesis: 1) The hypothesis must be formulated briefly but clearly., 2) The hypothesis must clearly show a relationship between two or more variables, 3) The hypothesis must be supported by theories put forward by experts or relevant research results. So, from the expert opinions above, the researcher concludes that the hypothesis is a temporary answer that can later change.

The F test is used to determine the level of significance of the influence of independent variables together on the dependent variable. The degree of confidence used is 0.05 by comparing the calculated F and F table (Ghozali, 2006). The F test is used to determine the extent to which the dependent variables simultaneously used are able to explain the independent variables. Proof is done by comparing the critical value of Ftable with the calculated F value against the variance analysis table. If the calculated F value > Ftable then the Null Hypothesis (Ho) is rejected and the Alternative Hypothesis (Ha) is accepted. This means that statistically the data is used to prove that all independent variables have an effect on the dependent variable.

Discussion

Learning Models are very much needed by researchers and educators, because the success or failure of students in learning depends on the right learning model used according to the material being studied so that the learning that is designed can be more varied. So in this study on the Leguminosae Family material, the method used is an environmentally based method. The application of the environmentally based method in this study aims to determine the data on the environmental care values of students who are taught using the Environmentally Based method. The data obtained in this study are initial test scores, post-tests, gain improvement score results, average student environmental care values so that later the influence of the environmentally based method used will be seen. According to Karjiyadi (2012), he said that: "Environmental-based learning leads to learning that utilizes the environment as a source of learning. The environment can be formatted or used as a source of learning. In this case, teachers can link the material taught with the real-world situations of students so that they can encourage students to make connections between the knowledge they have and its application in everyday life". According to Mulyasa (Wahyuni, 2010: 12) learning based on the environmental approach can be done in two ways: 1) Bringing students to the environment for learning purposes. This can be done by field trip methods, assignment methods, and others, 2) Bringing sources from the environment to school (class) for learning purposes. These sources can be original sources, such as resource persons, or imitation sources, such as models and pictures.

Based on the opinions above, environmental-based learning is learning that utilizes the environment as a learning resource that guides students to connect their knowledge with everyday life.

The use of this environmental-based method shows the value of students' environmental care in the cognitive domain, namely the results of the test scores that are tested. Data on the results of student test scores before using the Environmental-based learning method by conducting an initial ability test obtained an average of 26.84% by looking at these results, it can be seen that the average value of the initial test is a very low level of mastery with the indicator of the environmental care attitude skill assessment score. This is usually because in the implementation of the initial test, students were given learning using an environmental-based method.

The data of the results of the student test scores after using the Environmental-Based learning method with the provision of a post-test obtained an average of 63.53% from the results of this average value, it can be seen that there was an increase in student test scores because the Environmental-Based method has advantages in its application, namely environmental learning that provides a positive nuance, more real learning and is based on natural resources. The results of the Gain calculation obtained from the test testing then obtained the final increase score value, it can be seen that in the Understanding Plants of the Leguminosae Family indicator, a gain of 0.64 was obtained in the moderate category, and the acquisition from the observation sheet for the category of Understanding Plants of the Leguminosae Family was 80%, because during the observation activity the teacher guided the observation of activities during the learning process

The gain score result on the indicator Maintaining environmental sustainability is 0.32 in the moderate category, while the value obtained from the observation sheet is 90%, students are quite capable of maintaining environmental sustainability based on the actions given

The gain score result on the indicator Caring for Leguminosae family plants is 0.46 in the moderate category, while the value obtained from the observation sheet is 70%, students have the ability in caring for plants and the surrounding environment.

The gain score result on the indicator Preventing environmental pollution is 0.58 in the moderate category, while the value obtained from the observation sheet is 100%, students can apply the nature of not polluting the surrounding environment.

The gain score results on the indicator Understanding the role of plants in environmental sustainability, which is 0.38, are in the sufficient category, while the value obtained from the observation sheet is 90%, students are able to answer and provide explanations when faced with a problem. Overall, the results of the study indicate that the application of the Environmental-Based learning method has a significant effect on improving students' skills in understanding Leguminosae Family plants, maintaining environmental sustainability, caring for Leguminosae family plants, preventing environmental pollution, and understanding the role of plants. and has no significant effect on improving students' skills in applying concepts. From the results of the percentage of scores obtained on the observation sheet, according to the environmental care value indicator, it was obtained that for the indicator of understanding Leguminosae Family plants, a score of 80% was obtained, this means that the ability to understand Leguminosae plants owned by students is very good. For the indicator of maintaining environmental sustainability, a score of 90% was obtained, this means that students' ability to maintain environmental sustainability is classified as very good. The indicator of caring for Leguminosae family plants obtained a score of 70%, this means that students' ability in the indicator of caring for Leguminosae family plants is classified as sufficient. The indicator Preventing environmental pollution obtained a score of 100%, this means that students' ability to maintain the surrounding environment is classified as very good. The indicator of understanding the role of plants obtained a score of 90%, which means that students' ability to understand the role of plants is classified as very good. The results of the normality test on the initial test and post-test with a real level of 0.05 with the number of students (N) 32 with 0.156 are, for the initial test t_count < t_table, namely 0.1235 < 0.156 so that it is stated that the initial test value data is distributed t normally. Likewise, the results of the normality test on the post-test obtained t_count < t_table, namely 0.147 < 0.156 also stated that the data is normally distributed. Based on the homogeneity test data, it is known that the initial test variance (s2) = 73.96 and the post-test variance (S2) = 110.16, so that the calculated F = 1.48 is obtained. From the F distribution list, the F value for $\alpha = 0.05$ dk numerator (V) = (n - 1) = (32 - 1 = 31) dk denominator (V) =

(n - 1) = (32 - 1 = 20) So that the F_table = 1.56 is obtained. Because F_count < F_table = 1.48 < 1.56, it can be stated that the data presented has a homogeneous variance

The results of the hypothesis test calculation that has been carried out, it is known that the number of squared deviations is 12,290.687 by using this value, it can be seen that the t_count is 10.34. The t_count value obtained is then compared with the Ttable value with dk (32) = 1.69 Based on the results of the data calculation above, it can be seen that the value of student care using the environment-based method has a real influence. This can also be seen from the results of the calculation of the final increase score (gain), where the gain score for each indicator is classified as moderate. This indicates that the environmental care value possessed by students has increased. The final gain score that is still relatively low is in the indicator of maintaining environmental sustainability, which only gets a gain score of 0.32 in the moderate category. Some things that cause this indicator not to be achieved are that students still find it difficult to connect what they have learned or what they get with the reality or problems they encounter in the field. Based on the calculation results that have been obtained, it can be seen that in this study the alternative hypothesis (Ha) is accepted while simultaneously rejecting the null hypothesis (Ho), which means that it can be stated that there is a significant influence.

According to Dantes (2012) a hypothesis is a presumption or assumption that must be tested through data or facts obtained through research. According to Sugiyono (2009) a hypothesis is a temporary answer to the formulation of a research problem, where the formulation of the research problem has been stated in the form of a question. The hypothesis is said to be temporary because the answer given is only based on theory. Borg and Gall (1979: 61) proposed the following requirements for a hypothesis: 1) The hypothesis must be formulated briefly but clearly., 2) The hypothesis must clearly show a relationship between two or more variables, 3) The hypothesis must be supported by theories put forward by experts or relevant research results. So, from the expert opinions above, the researcher concludes that the hypothesis is a temporary answer that can later change. The F test is used to determine the level of significance of the influence of independent variables together on the dependent variable. The degree of confidence used is 0.05 by comparing the calculated F and F table (Ghozali, 2006). The F test is used to determine the extent to which the dependent variables simultaneously used are able to explain the independent variables. Proof is done by comparing the critical value of Ftable with the calculated F value against the variance analysis table. If the calculated F value > Ftable then the Null Hypothesis (Ho) is rejected and the Alternative Hypothesis (Ha) is accepted. This means that statistically the data is used to prove that all independent variables have an effect on the dependent variable..

CONCLUSION

Based on the results of the analysis obtained from the initial test and post-test, then the gain is calculated, then the Biology Education students of FKIP UISU have obtained a final increase score which is quite good, as well as related to the calculation of the observation sheet that has been assessed. Each indicator of the environmental care value shows a good increase in gain. In the Understanding of Leguminosae Family plants indicator, namely 0.64 is in the moderate category, while the value obtained from the observation sheet is 80%.

Based on the results of the data analysis obtained from the calculation of the observation sheet, a fairly high percentage of the final score is obtained, namely 100% in the Preventing environmental pollution indicator.

Based on the results of the hypothesis test, it was obtained T_(count)> T_(table) or 10.34> 1.69 at a confidence level of 0.05, so there is a significant influence of environmental-based learning on students' environmental care values at The Le Hu Garden

REFERENCES

Alimah, S., & Marianti, A. (2016). Jelajah Alam Sekitar Pendekatan, Strategi, Model, dan Metode Pembelajaran Biologi Berkarakter Untuk Konservasi. In *Researchgate.Net* (Issue October).

Aruan, J. (2020). Pengaruh Regulasi Diri dan Lingkungan Belajar Terhadap Prestasi Belajar. *Psikoborneo: Jurnal Ilmiah Psikologi*, *8*(1), 83. https://doi.org/10.30872/psikoborneo.v8i1.4862

Atmoko, T. (2017). Bab II kajian teori. *BAB 2 Kajian Teori*, *1*, 16–72.

Berliana, N. (2021). Landasan Teori اديبج. *Dasar-Dasar Ilmu Politik*, 17–39.

Galappaththi, E. K. (2013). *No* 主観的健康感を中心とした在宅高齢者における健康関連指標に関する共分散構造分析*Title*. *55*, 8–28.

HARIRI, M. R., PENIWIDIYANTI, P., IRSYAM, A. S. D., & ASTUTI, R. S. (2021). Keanekaragaman, Status

Konservasi, dan Potensi Suku Fabaceae Koleksi Kebun Raya Bogor. *Tropical Bioscience: Journal of Biological Science*, *1*(2), 1–10. https://doi.org/10.32678/tropicalbiosci.v1i2.4310

Ii, B. A. B. (2007). *Raw Input*. 14–47.

Ii, B. A. B. (2020). *Pengentian Model Pem Bab 2*. 8–29.

Ii, B. A. B., & Supervisi, A. (2020). *Kajian Teoretik kreativitas*. *4*(2009), 25–108.

Iii, B. A. B., & Penelitian, M. (2019). *Afiyah Lathifah, 2022 Penerapan Model Cooperative Learning Tipe Jigsaw Dalam Tema 8 Muatan Pembelajaran IPS di SD Universitas Pendidikan Indonesia | repository.upi.edu | perpustakaan.upi.edu*. *2008*, 23–35.

Irsyam, A. S. D., & Priyanti, P. (2016). Suku Fabaceae Di Kampus Universitas Islam Negeri (Uin) Syarif Hidayatullah, Jakarta, Bagian 1: Tumbuhan Polong Berperawakan Pohon. *Al-Kauniyah: Jurnal Biologi*, *9*(1). https://doi.org/10.15408/kauniyah.v9i1.3257

Ismail, M. J. (2021). Pendidikan Karakter Peduli Lingkungan Dan Menjaga Kebersihan Di Sekolah. *Guru Tua : Jurnal Pendidikan Dan Pembelajaran*, *4*(1), 59–68. https://doi.org/10.31970/gurutua.v4i1.67

Karakter, A. N., Film, D., Riko, A., Series, T. H. E., Media, S., Karakter, P., & Di, S. (2014). *Maryam Awaliyah, 2022 ANALISIS NILAI-NILAI KARAKTER DALAM FILM ANIMASI RIKO THE SERIES SEBAGAI MEDIA PEMBELAJARAN KARAKTER SISWA DI SD Universitas Pendidikan Indonesia | repository.upi.edu | perpustakaan.upi.edu*. 1–6.

Kurniasih, N., Purwanto, P., & Siahaan, P. (2019). Penerapan Cooperative Learning Tipe TPSQ untuk Mengoptimalkan Kemampuan Membuat Peta Konsep dan Prestasi Belajar Siswa Kelas VIII pada Materi Optik. *WaPFi (Wahana Pendidikan Fisika)*, *4*(2), 127–133. https://doi.org/10.17509/wapfi.v4i2.20158

Mussardo, G. (2019). Perencanaan Pembelajran. *Statistical Field Theor*, *53*(9), 1689–1699.

Nugrawiyati, J. (2015). Lingkungan Sebagai Media Pembelajaran Bahasa Arab. *El-Wasathiya: Jurnal Studi Agama*, *03*(October), 45–60. http://ejournal.kopertais4.or.id/mataraman/index.php/washatiya/article/view/2005

Nurmala, I. (2021). Analisis Kepuasan Penumpang Terhadap Rekonstruksi Terminal Check-in Counter di Bandar Udara Internasional Raden Inten II Lampung. *Sekolah Tinggi Teknologi Dirgantara*, 21–28. https://digilib.sttkd.ac.id/id/eprint/1694

Pane, A., & Darwis Dasopang, M. (2017). Belajar Dan Pembelajaran. *FITRAH:Jurnal Kajian Ilmu-Ilmu Keislaman*, *3*(2), 333. https://doi.org/10.24952/fitrah.v3i2.945

Pustaka, A. K. (2010). *perpustakaan.uns.ac.id digilib.uns.ac.id*. 8–49.

Rasyid. (2014). No Titleゝ. *Pontificia Universidad Catolica Del Peru*, *8*(33), 44.

Rohrig, K. (Hrsg. ., Tan, E., Rackwitz, F., Glasenapp, R., Rudolph, C., Grabe, J., Bienen, B., Boulanger, R. W., Khosravifar, A., Haiderali, A. E., Madabhushi, G., Li, W., Zhu, B., Yang, M., Sampieri, R. H., Schroyens, W. J., Schaeken, W., D'Ydewalle, G., Fitzgerald, B., … Vanneste, G. (2013). No 主観的健康感を中心とした在宅高齢者における　健康関連指標に関する共分散構造分析Title. *Bautechnik*, *34*(5), 1–6. http://ascelibrary.org/doi/pdf/10.1061/(ASCE)0733-9410(1994)120:1(225)%0Ahttp://dx.doi.org/10.1016/j.conbuildmat.2013.07.024%0Ahttp://eprints.uanl.mx/5481/1/1020149995.PDF%0Ahttp://scholar.google.com/scholar?hl=en&btnG=Search&q=intitle:windenergie+report+

Rustaman, N. Y. (2011). Pendidikan Biologi dan Trend Penelitiannya. *Jurnal FMIPA Universitas Pendidikan Indonesia.*, 1–24.

Stocks, N. (2016). 済無*No Title No Title No Title*. 1–23.

Universitas Pendidikan Indonesia. (2021). Metodologi Penelitian dalam penelitian Bioetik. *Perpustakaan Unoversitas Pendidikan Indonesia* , 5–20.

Warsita, B. (2018). Teori Belajar Robert M. Gagne Dan Implikasinya Pada Pentingnya Pusat Sumber Belajar. *Jurnal Teknodik*, *XII*(1), 064–078. https://doi.org/10.32550/teknodik.v12i1.421

Zaini Miftach. (2018a). 済無*No Title No Title No Title*. 53–54.

Zaini Miftach. (2018b). 済無*No Title No Title No Title*. *2018*, 53–54.

Δούκας, A., Gréhaigne, J. F., Godbout, P., Κοντογιάννης, M., Mannetti, L., Pierro, A., Kruglanski, A. W., Taris, T.,

Bezinovic, P., Ashforth, B. E., Mael, F., Kruglanski, A. W., Webster, D. M., Klem, A., Pierro, A., Mannetti, L., De Grada, E., Livi, S., Kruglanski, A. W., … Μόττη - Στεφανίδη, Φ. (2015). 済無No Title No Title No Title. *Personality and Social Psychology Bulletin*, *18*(1), 346–365. http://dx.doi.org/10.1016/B978-0-12-849873-6.00001-7%0Ahttp://saber.ucv.ve/ojs/index.php/rev_venes/article/view/1112%0Ahttp://dx.doi.org/10.1016/j.copsyc.2016.08.001%0Ahttp://dx.doi.org/10.1080/10463283.2015.1106712%0Ahttp://dx.doi.org/10.1016/j.jesp.2016.09.01