



The Effect of Multiple Intelligences-Based Learning Strategies on the Naturalist Intelligence of Elementary School Students

Pengaruh Strategi Pembelajaran Berbasis *Multiple Intelligences* Terhadap Kecerdasan Naturalis Siswa Sekolah Dasar

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Received: 12-06-2022

Accepted: 20-10-2022

Published: 30-10-2022

How to cite this article:

Mukhtar., Kune, S., & Syamsuddin, R. (2022). The Effect of Multiple Intelligences-Based Learning Strategies on the Naturalist Intelligence of Elementary School Students. *Pedagogik Journal of Islamic Elementary School*, Vol. 5(2), 213–226. <https://doi.org/10.24256/pijies.v5i2.2791>

Abstract

This study aims to determine the effect of multiple intelligences-based learning strategies on the natural intelligence of elementary school students on the concept of ecosystem. The subjects of this study were the fifth-grade students of Aroeppala State Elementary School, Makassar City, which consisted of 28 experimental class students and 25 control class students. This study uses a quantitative method with a quasi-experimental model with a non-equivalent control group design. The data collection technique is through observation, tests, and documentation. The data analysis technique used is descriptive and inferential analysis. The inferential test is in the form of an analysis prerequisite test consisting of a normality test and a homogeneity test as well as an N-Gain test, then a hypothesis test using a 2-sample T-test. The results showed an effect of multiple intelligences-based learning strategies on the natural intelligence of elementary school students. This strategy makes students actively involved in the teaching and learning process to provide a learning experience that is meaningful, more interesting, and easy to understand.

Keyword: multiple intelligences; natural intelligence; elementary science

Abstrak

Penelitian ini bertujuan untuk mengetahui pengaruh strategi pembelajaran berbasis multiple intelligences terhadap kecerdasan natural siswa sekolah dasar pada konsep ekosistem. Subjek penelitian ini adalah peserta didik kelas V SDN Aroeppala Kota Makassar yang terdiri dari 28 orang siswa kelas eksperimen dan 25 orang siswa kelas kontrol. Penelitian ini menggunakan metode kuantitatif dengan model quasi experiment dengan desain non-equivalent control grup. Teknik pengumpulan datanya melalui pengamatan, tes, dan dokumentasi. Teknik analisis data yang digunakan adalah analisis deskriptif dan inferensial. Uji inferensial berupa uji prasyarat analisis yang terdiri dari uji normalitas dan uji homogenitas serta uji N-Gain, kemudian uji hipotesis menggunakan Uji T-tes 2 sampel. Hasil penelitian menunjukkan bahwa terdapat pengaruh strategi pembelajaran berbasis

multiple intelligences terhadap kecerdasan natural siswa sekolah dasar. Strategi tersebut membuat siswa terlibat aktif dalam proses belajar mengajar sehingga memberikan pengalaman belajar yang bermakna, lebih menarik, dan mudah dipahami.

Kata kunci: *multiple intelligences; kecerdasan natural; ipa sd*

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Introduction

Every child has potential that can be developed following the law's mandate. Humans possess nine potentials or intelligence that can be developed in learning. The theory is called multiple intelligences, in other words, multiple intelligences and can also be interpreted as multiple intelligences (Indria, 2020). The theory is the first to justify the diversity of human intellectual abilities.

This intelligence includes verbal intelligence, logical intelligence, visual intelligence, kinesthetic intelligence, musical intelligence, interpersonal intelligence, intrapersonal intelligence, naturalist intelligence, and spiritual intelligence. Multiple intelligences can be used by parents and educators as a reference, that each individual has different characteristics and different abilities. So far, the paradigm that has developed in society is that humans are said to be smart if they are intelligent only in mathematical logic, so other intelligence is neglected and not even considered necessary. This happens because of a lack of knowledge about multiple intelligences, some of which are sometimes overlooked, namely spiritual intelligence and naturalist intelligence, even though spiritual intelligence and naturalist intelligence are closely related to human life, especially in the world of education (Chatif, 2011).

Naturalist intelligence is the ability to categorize and classify the state of organisms such as plants, animals, and nature. One characteristic of naturalist intelligence is happiness with nature. Animals, for example, dare to approach, hold, stroke, and even have the instinct to care for them. The core components of naturalist intelligence are sensitivity to nature, distinguishing members of a species, recognising the existence of other species, and mapping the relationship between several species, both formally and informally (Yaumi, 2013). Naturalist intelligence is closely related to natural science learning.

Natural science is one of the learning materials taught in elementary schools. Natural science is a translation of words in English, namely nature science, meaning natural science (IPA). Natural science is also known as the study of nature and natural phenomena. Science investigates natural phenomena that are systematically arranged based on the observations and experiments humans have carried out. Learning natural sciences encourages students to reveal natural phenomena and phenomena based on scientific principles, as is done by researchers. Learning natural sciences is not just transferring knowledge informatively and memorizing concepts and theories. Learning

natural sciences must involve students in mental and physical activities to get real experience, so scientific attitudes are formed (Samatowa, 2016).

Sujana explained the various reasons that caused science to be included in school subjects, including (1) Natural science is very beneficial for a nation. Science is often referred to as the backbone of a nation's development; (2) Natural science will provide opportunities for students to be able to develop higher-order thinking skills, such as creative thinking and critical thinking skills, which of course, are supported by using learning models that allow students to develop thinking skills; (3) Natural science is a subject that is not just rote, in the learning process experiments are carried out that allow students to have characteristics like scientists; (4) Natural sciences have high educational values, which have the potential to shape the child's personality as a whole (Sujana, 2013).

Based on observations at the Aroepala state elementary school, many teachers still use conventional natural science learning strategies that focus on rote material. Furthermore, learning tends to be teacher-dominated and one-way in nature. This learning method is irrelevant to supporting multiple intelligences, especially naturalist and spiritual intelligence. Conventional teaching methods position the teacher as the owner of knowledge or the authority of knowledge. Teachers are considered people who provide knowledge or knowledge (Endro, 2011). While students become passive objects, only recipients of knowledge so that students become uncritical, therefore teachers are expected to design appropriate learning strategies.

One of the learning strategies that can facilitate this is multiple intelligences-based learning strategies. The narrative (Said, A. & Andi Budimanjaya, 2015) explained that the multiple intelligences-based learning strategies are a method to open horizons by passing through each student's eight intelligence doors, but thus, consolidate all intelligence into one unique unit. Enables students to solve learning problems in an exceptional style.

Ideal learning is learning that can include students as the subject or learning subjects with the teacher's support as a facilitator in the learning process. Teachers must prepare and examine the type of intelligence that is dominant in students before teaching to determine the right strategy for maximizing the potential or abilities that exist in students (Sanjaya, 2006).

The results of research conducted by Salama show a significant effect of applying multiple intelligences-based learning strategies on science learning outcomes in the cognitive, affective, and psychomotor domains and learning outcomes in all domains. This research applies the concept of the ecosystem (Salama, 2016). The ecosystem is one of the materials in science which is quite complex. In addition, ecosystems are also discussed in the Qur'an (Surah Thaha: 53). The verse implicitly tells us how there is an interaction between abiotic components, in this case, water and living things. Water is needed in life, as plants need water to grow, and many other interactions between abiotic and biotic components occur, which are studied in the ecosystem chapter.

Based on this background, this research is focused on knowing the effect of multiple intelligences-based learning strategies on the naturalist intelligence of elementary school students on the ecosystem concept material.

Method

This research is quantitative. This research design is a quasi-experiment with a non-equivalent control group design. The population in this study were fifth-grade elementary school students with the sampling technique in this study using a random sampling technique. The samples taken were class VA totalling 25 people, as the control class and class VB totaling 28 people, as the experimental class. This research was carried out for two months, from November to December 2021. The dependent variable in this study was naturalist intelligence, and the independent variable was the Multiple Intelligences-based learning strategies. The indicators for assessing naturalist intelligence are adapting intelligence indicators from (Prasetyo, 2009), which are adapted to the concept of ecosystems, including understanding interactions between living things, understanding the interactions of living things with their environment, caring for existing ecosystems and being able to categorize living things based on their general characteristics. These indicators were developed into several questions to measure students' naturalist intelligence. As for the observations, student observations were carried out, which included indicators of naturalist intelligence during the learning process in general, especially in working on student worksheets that had been designed that contain indicators of naturalist intelligence. Data collection techniques in this study were through observation, pre-test and post-test tests, and documentation. The test is in the form of essay questions containing indicators of naturalist intelligence

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which a team of expert validators has previously validated. The data analysis technique used was descriptive and inferential analysis. The inferential test is in the form of an analytical prerequisite test consisting of a normality test and a homogeneity test as well as an N-Gain test, then a hypothesis test using a 2-sample T-test (Ramadhani, 2021).

Result

Naturalist Intelligence

The results of observing the activities of students' naturalist intelligence during the learning process can be seen in Table 1.

Table 1 *Naturalist Intelligence Activities of Students in Control and Experiment Classes*

Class	Average Activity	Category
Control	74,6 %	Active
Experiment	97,79 %	Very active

Based on the data in Table 1, the average activeness of students in the experimental class is higher than the control class. Besides that, there are also differences in categories. The control class is in the active category, while the experimental class is in the active category. The following data distribution of statistical values for the two classes can be seen in Table 2.

Table 2 *Distribution of Naturalist Intelligence Descriptive Statistics in Pretest and Posttest*

Category	Pre test		Post test	
	Control	Experiment	Control	Experiment
Maximum	80	80	90	95
Minimum	50	50	60	65
Average	66.8	66.25	74.2	81.25
Std. Deviation	9.56	8.00	8.37	7.65
Modus	75	70	80	85

Based on Table 2, the data obtained for the pre-test values where the experimental and control classes have the same highest and lowest scores, 80 and 50, respectively. While the average value for the control class is 66.8 and the experimental class is 66.25. The standard deviation for the control class is 9.56, and the experimental class is 8. The control class mode is 75, while the experimental class is 70. For the post-test value, there is an increase. The experimental class obtained the highest value with

a value of 95, while the control class was 90. For the lowest value, the class control is 60, while the experimental class is 65. The experimental class has a higher average of 81.25, while the control class is 74.2. The results of the descriptive analysis for the categorization obtained from the results of the pre and post-test between the control and experimental class can be seen in Table 3.

Table 3 *Categorization of Descriptive Statistics of Naturalist Intelligence Pretest and Posttest*

Category	Control				Experiment			
	Pre test		Post Test		Pre test		Post Test	
	F	%	F	%	F	%	F	%
very high	0	0	1	4	0	0	5	17.86
High	3	12	9	36	2	7.14	15	53.57
Medium	10	40	10	40	11	39.3	6	21.43
Low	6	24	5	20	11	39.3	2	7.14
very low	6	24	0	0	4	14.3	0	0
Total	25	100	25	100	28	100	28	100

Based on Table 3, the percentage categorization of naturalist intelligence values for the control and experimental classes shows a very high increase in the category of post-test results between the control and experimental classes. The control class is only 4%, while the experimental class is 17.86%. The control class is 36% for the high category, while the experimental class is 53.57%. The control class is 20% for the moderate category, while the experimental class is 7.14%. For the low and very low categories, each is 0%. From these data, it is known that there is an effect of implementing learning strategies on students' naturalist intelligence.

Uji Normalitas

Table 4 *Normality Test*

Test	Statistic	df	Sig.
pretest control	.154	25	.128
control posttest	.156	25	.121
experimental pretest	.152	28	.095
experimental posttest	.152	28	.095

Normality test using SPSS version 20 obtained sig value. All classes are more significant than 0.05, indicating that all data obtained are normally distributed.

Uji Homogenitas

Table 5 Homogeneity Test

	Levene Statistic	df1	df2	Sig.
Based on Mean	.524	1	51	.473
Based on Median	.463	1	51	.499
Based on Median and with adjusted df	.463	1	50.948	.499
Based on trimmed mean	.519	1	51	.475

The homogeneity test used SPSS version 20. Based on Table 5, the sig value was obtained. (0.499) is more significant than 0.05, it can be concluded that the data obtained is homogeneous between the control and experimental classes.

N-Gain Test

Tabel 6 N-Gain Test

Class	N-Gain	Category
Control	0.22	Low
Experiment	0.46	Medium

Based on Table 6, the experimental class has an N-gain of 0.46, higher than the control class at 0.22. In addition, in categorization, the control class is in a low category while the experimental class is in the medium category.

T-Test

Table 7 Independent Sample T-test Naturalist Intelligence

	F	Sig.	t	df	Sig. (2-tailed)
Naturalist Intelligence Equal variances assumed	.524	.473	3.202	51	.002
Equal variances not assumed			3.185	48.940	.003

Table 7 shows the value of sig (0.002) > 0.05. The hypothesis is accepted, namely that there is a significant influence of Multiple Intelligences-based learning strategies on naturalist intelligence in the concept of ecosystem class V Areoppala State Elementary School Makassar City.

Discussion***The effect of multiple intelligences strategy on students' naturalist intelligence***

The results of the hypothesis test data show that there is an effect of Multiple Intelligences-based Learning strategies on students' naturalist intelligence. In addition,

the experimental class N-Gain value of 0.46 is in the medium category, while the control class is 0.22 in the low category. In addition, the experimental class's average value (mean) was 81.25, higher than the control class, which was 74.2. The observations during the study showed that the average activeness of students in the control class was 74.6% in the active category. Meanwhile, the experimental class is in the range of 97.79% in the very active category.

In the learning process, the implementation of the Multiple Intelligences-based Learning strategy in the experimental class made students more active than students in the control class. The Multiple Intelligences-based Learning Strategy allows students to be actively involved in the learning process because it is structured to involve students with various multiple intelligences, in contrast to the control class. In the control class, the learning process is conventional, students tend to be passive, and learning is teacher-centred.

The use of Multiple Intelligences-based Learning strategies is very suitable to be taught on the concept of ecosystems, especially in developing students' naturalist intelligence on the concept of ecosystems, where the activities carried out by students are designed according to indicators of naturalist intelligence, starting from students being asked to observe and think a lot about the interactions between living things that exist. Surroundings so that they can make groupings based on the similarities or differences possessed by each component of the ecosystem. Ultimately, there will be a caring attitude towards the surrounding environment (Hulkairiyah, 2020).

During the learning process, in the experimental class, groups were formed from which students were expected to be actively involved in constructing the knowledge to be gained, and the teacher acted as a facilitator. For example, when teaching the food chain sub-material, in 1 group, students are asked to understand what a food chain is and make an example of a food chain. With the application of Multiple Intelligences-based learning strategies, students are expected to work together to understand the concept based on their intelligence. Students with linguistic intelligence can understand their friends by reading various concepts in books or other sources. For students who have artistic intelligence can be involved in illustrating examples of food chains. Students with intrapersonal intelligence can appear in class to present the results of their group discussions. Students who are dominant in logical intelligence (logic) can analyze how the order of eating and being eaten between one organism and

another organism is formed so that a food chain is formed. The application of Multiple Intelligence-based learning strategies encourages students to maximize their intelligence in understanding a concept, and here the teacher has an essential role in facilitating students.

A meaningful learning experience can have a positive effect, especially on learning outcomes. In this case, what is discussed is naturalist intelligence. Before implementing the Multiple Intelligences-based Learning strategy, a pretest was conducted to provide an initial picture of the naturalist intelligence level of the students. After that, the concept of the ecosystem was taught in 2 different classes, the experimental and control classes. After testing the hypothesis through the data obtained, it shows an effect of Multiple Intelligences-based Learning strategies on students' naturalist intelligence. This is in line with research conducted by (Riberu, 2019) entitled *The Effect of Multiple Intelligences Strategy on Process Skills and Learning Outcomes of SD Inpres Ana Gowa*, where the conclusion shows that there is an influence of Multiple Intelligences-based learning strategies on Process Skills and Learning Outcomes. The Multiple Intelligences Learning Approach can improve the learning achievement of elementary school students (Yulmiati, 2012). Using Multiple Intelligences-based Learning strategies can affect students' naturalist intelligence because this strategy facilitates students with various bits of intelligence in understanding the concept of ecosystems. This strategy makes students more active and motivated in understanding the concepts being taught with the intelligence that each of them has.

Conclusion

Based on the results of the research and discussion carried out, it can be concluded that multiple intelligences-based learning strategies have an effect on the naturalist intelligence of fifth-grade elementary school students in Aroeppala Makassar City on the concept of ecosystem. Multiple intelligences-based learning strategies can make students actively involved because each stage of learning requires students to play an active role in the teaching and learning process so that the existence of a learning experience means making learning more interesting, easy to understand, and long remembered by students. However, in practice, implementing multiple

intelligences-based learning strategies takes a long time, so the teacher must be skilled in utilizing the available time before it is applied.

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