

Effectiveness of the Application of Discovery Learning to the Naturalist Intelligence of Children About the Natural Environment in Children Aged 5-6 Years

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Abstract—The aim of this research is to find out how effective the discovery learning is to the naturalist intelligence of children about the natural environment in Al Ikhsan Ujungbatu Kindergarten. This research uses experimental research with pre-experimental planning design. The sample used in this study there were 17 children with 8 boys and 9 girls. This research was conducted 4 times and pre-test and post-test will be conducted. With the stages of assigning classes, preparing questions according to the application of discovery Learning, conducting a pre-test, giving treatment, holding a post-test, and determining the difference in the average scores of children. Data analysis techniques using t-test with the help of SPSS program ver 16.0. The research hypothesis is that there is a significant increase in the naturalist intelligence of children about the natural environment in children after the application of the Discovery Learning approach. This can be seen from the results of data analysis obtained $t = -20.3357$ and $p = 0.000$. Because $p < 0.05$ it can be concluded that there is a significant increase after using discovery learning approach in learning.

Keyword—*discovery learning, naturalist intelligence, early childhood*

I. INTRODUCTION

According to Law No. 20 of 2003 concerning the National Education System Chapter 1, article 1, point 14 states that Early Childhood Education is an effort to guide children from birth to six years of age through the provision of educational stimuli to help physical and spiritual growth and development. so that children have readiness to enter further education. While Article 28 of the (ECD) early childhood education stated that early childhood education, basic education held before, can be organized through formal education, non-formal and informal at au [1]

At this early age, it is a time when children's growth and development increase very rapidly. This period is known as the golden age (golden age). This period is the golden age of a child which is the most important period in a child's life to optimize his growth and development. This period is a time when the development of nerve cells is growing rapidly. This golden age is also the initial determinant of children's intelligence development.

Early childhood education is based on a number of methodical consideration for the purpose of providing opportunities for the development of children personality. That is, education Kindergarten gives children the opportunity to develop personality, therefore for early childhood education, especially in kindergarten need to provide a variety of activities that can develop various aspects of parenting skills.

Every human being has more than 100 billion neuronal neural networks found in the brain that are always growing rapidly. By providing stimulation to be able to develop every dendrite that will grow. At the age of toddlers the development of nerve cells will develop at a rate of 80% and will always increase when getting the right stimulation. The development of these nerve cells has decreased after the age of 45 years. Thus the development and delivery of stimulation in early childhood is very important. To increase intelligence possessed by children.

When using discovery learning model, it is thought to be effective to foster children's interest in the teaching and learning process. The ability of children to explore children's creativity will increase. Children will be more free in creating new things and children will easily find new learning. The environment is a rich and interesting learning resource for children.

According to Carin & Sund in [2] Discovery Learning is a mental process of understanding concepts and principles, and is a learning how to use the mind to find. With discovery learning, children can learn to gain knowledge uniquely and can be in accordance with their own thinking because the child finds knowledge itself.

The environment can be a fun place for children. If the teacher introduces the animal when studying in the classroom, by utilizing the environment the child will be able to gain even more experience. So that it will affect the increasing naturalistic intelligence of children. But in fact it is now many children who do not understand the importance of the environment. Though the introduction of the environment from an early age is very important. Giving learning from an early age will be firmly attached and imprint on the child.

As Piaget has stated that every child has its own way of interpreting and adapting to its environment (cognitive skills

theory). According to him, every child has a cognitive structure called schemata, a system of concepts that exist in the mind as a result of understanding the objects in their environment. An understanding of the object takes place through a process of assimilation (connecting objects with concepts that are already in mind) and accommodation (the process of using concepts in mind to interpret objects) .

Intelligence possessed by Gardner's classifies there are 9 intelligence possessed by humans, which consists of: (1) Linguistic Intelligence ; (2) Logical Mathematical Intelligence; (3) Spatial Intelligence; (4) Kinetic Intelligence; (5) Musical Intelligence; (6) Interpersonal Intelligence; (7) Intrapersonal Intelligence; (8) Naturalist intelligence; and (9) Existential Intelligence [3].

The definition that explains about creative thinking according to Daskolia in [4] says that it is related to environmental science where " creative thinking is considered to be of an important quality of thinking and learning about the environment and current environment issue, and coping effectively with them, or prerequisite for visioning and designing alternative sustainable futures. " .Creative Thinking is implicitly an ability that is essential in thinking about and learning about the environment and environmental issues to see and design alternative environmental sustainability in the future.

Learning activities are possible to be more attractive to children because the environment provides a very diverse learning source and many choices. The hobby of learning from an early age is a basic capital that is needed in the framework of preparing learning societies and human resources in the future. Environmental learning does not have to bring children to the natural environment such as zoos, livestock, or other places. They can learn from their closest environment. Get to know the environment around the housing around the school for example.

Children love new and challenging things. In this learning can stimulate children's creativity in making things provided in the environment around the child. Children can move freely and can create games they want from materials that are around the environment. Lack of concern for children about the environment that makes children only focus on instant games. The limited ability of children can now be seen from the games and facilities that only children get from school. Children can only explore while playing at school. At home, most children are only given game restrictions from electronics. Like remote control, Gadget, Android, and others. Children can only remain silent playing the game in hand. And it has a bad influence on children's development and creative power.

The rest of this paper is organized as follow: Section II describes the data and proposed methodology. Section III describes the obtained results and following by discussion. Finally, Section IV concludes this work.

II. DATA & METHODOLOGY

This section presents the data used and the proposed methodology.

A. Data

In this study found a population of 17 children in a class that will be used as a sample. As for where the number of children in the class is 8 boys and 9 girls were taken in this study. In determining the sample of this research is to use saturated sampling techniques. It is a technique of determining when all members of the population are used as samples . This is done because in this study the number of population in this survey is relatively little so that the total sample of this study was taken all. This study was conducted on April-May 2018.

B. Methodology

Analysis of the data used to find out effectiveness of the application of discovery learning to children's naturalist intelligence about the natural environment in children aged 5-6 years . Measurements are used by using a comparison of treatment treatments . And use the t-test to calculate the average difference.

III. RESULTS AND DISCUSSION

A. Normality test

Normality tests are carried out to determine whether the distribution of data is normal or not. The provisions used are if the value of Sig <0.05 then the data is not normally distributed, on the contrary if the value of Sig > 0.05 then the data is normally distributed. The results of the normality test can be seen in the following Table I.

TABLE I.

<i>One-Sample Kolmogorov-Smirnov Test</i>			
		before	after
N		17	17
Normal Parameters ^a	Mean	37.71	61.82
	Std. Deviation	5.576	4.667
Most Extreme Differences	Absolute	.185	.188
	Positive	.185	.093
	Negative	-.153	-.188
Kolmogorov-Smirnov Z		.762	.774
Asymp. Sig. (2-tailed)		.607	.587
Distribution test is Normal.			

Source: Processed Research Data

A. Normality Test Results

Sig value before treatment is 0.607 and the sig value after treatment is 0.587. This value shows that the value of sig before treatment 0.607 > 0.05 and the value of sig after treatment 0.587 > 0.05 , the value of sig before and after treatment greater than the 0.05 significance level (sig > 0.05). This means that H0 is accepted, the sample comes from the population distributing normally.

B. Homogeneity Test

Analysis of homogeneity in this study , if the value in the column sig > 0.05 then H0 is accepted, if sig < 0.05 then H0 is

rejected. H0: Homogeneous variant Ha: Not Homogeneous Variant, and can be seen from the results of the Table II below:

TABLE II.
Statistics Test

	Before	After
Chi-Square	3.059 ^a	3.471 ^b
Df	10	11
Asymp. Sig.	.980	.983

Source: Processed Research Data

Based on the table in on the value of Asymp sig obtained before treatment 0,980 and after treatment 0,983 the value before treatment 0,980 > 0,05 and the value after treatment 0,983 > 0,05. The values before and after treatment are greater than 0,05, meaning that H0 is accepted. It can be concluded that both groups are homogeneous or have the same variance.

C. Linearity Test

Linearity testing aims to determine whether the data has a linear line or not (is the relationship between variables to be analyzed follow a straight line or not). To find out more can be seen in the following Table III.

TABLE III

ANOVA Table

			Sum of Squares	Df	Mean Square	F	Sig.
before after	Between Groups	(Combined)	420,529	11	38.230	2.482	.163
		Linearity	154,614	1	154.614	10.040	.025
		Deviation from Linearity	265,915	10	26.591	1.727	.284
	Within Groups	77,000	5	15.400			
Total			497,529	16			

Source: Processed Research Data

In the linearity test, the rule applies if sig from deviation from linearity > 0,05, the relationship between variables is linear. Conversely, if sig on deviation from linearity is smaller than 0,05 (sig < 0.05) then the relationship between variables is not linear. The data above shows that the Sig value of deviation from linearity is 0.284, the value is greater than 0,05 (0.284 > 0.05). It can be concluded that the relationship between variables is linear.

Based on the processed data results are known There are 17 indicators answered by children. Based on the results of the pre-test it can be seen that children's natural intelligence about the natural environment is in the medium category. Can be seen in the following Table IV:

TABLE IV

No.	Category	Score Range	F	%
1	High	52-68	1	6%
2	Medium	34-51	11	65%
3	Low	<34	5	29%
amount			17	100%

With categorization, it is determined to be three, namely high category with a range of 52-68 scores, moderate category 34-51, and low category <34. And it can be seen in the results of the administration of the Pre-test of naturalist intelligence ability in the application of discovery learning obtained from the data of 1 person occupying the highest category. And 11 people put in the medium category. And 5 people occupy the low category. It shows that the application of discovery learning to naturalist intelligence is included in the medium category.

Result of obtained from post-test at after being treated learning discovery application against the naturalist children about the natural environment can be seen in the following Table V:

TABLE V

No.	Category	Score Range	F	%
1	High	52-68	17	100%
2	Medium	34-51	0	0%
3	Low	<34	0	0%
amount			17	100%

In this study found results that experienced a significant increase, where the application of discovery learning to children's naturalist intelligence about natural environment experienced an increase in the high category.

In the t-test this study is stated to be normally distributed if the variable probability value is above the significance level of 0,05. Sig value before treatment is 0.607 and the sig value after treatment is 0.587. This value shows that the value of sig before treatment 0.607 > 0.05 and the value of sig after treatment 0.587 > 0.05, the value of sig before and after treatment greater than the 0.05 significance level (sig > 0.05). This means that H0 is accepted, the sample comes from the population distributing normally.

Homogeneity testing obtained Asymp sig value before treatment 0,980 and after treatment 0,983 the value before treatment 0,980 > 0,05 and the value after treatment 0,983 > 0,05. The values before and after treatment are greater than 0,05, meaning that H0 is accepted. It can be concluded that both groups are homogeneous or have the same variance. to see the difference between the results of the pre-test and post-test it is known that the result of t count = 20.357 and t table value from the calculation of the t test, with the df value of 16 at the 0.05 error level so that the t table value = 2.120. This value shows a significant change seen from the value of sig (2 tailed) of 0,000. The sig value is 0,000 < 0,05 or the sig value is small from 0,05, thus Ha is accepted and H0 is rejected. This means that the difference in value after treatment has a significant increase.

D. Comparison of Pre-test Data and Post-test

The results of the pre-test and post-test in this study can be seen in the recapitulation results shown in Table VI below:

TABLE VI. COMPARISON OF PRE-TEST AND POST-TEST DATA

No.	Category	Score Range	Before		After	
			F	%	F	%
1.	High	52-68	1	6	17	100
2.	Medium	34-51	14	65	0	0
3.	Low	<34	2	29	0	0

Source: Processed Research Data

The description of mastering science knowledge about the nature and environment of children before and after applying discovery learning can be presented in the form of bar charts, for more details can be seen in the Figure 1.

Based on the comparison of before and after treatment can be seen that all children have increased about nature and the environment that originally contained only one child in the high category, or 6% after being given treatment (treatment) 17 children got so high category or 100%. By knowing the results of the comparison in the data above, in this study the application of discovery learning to naturalistic children's intelligence about the natural environment experienced a significantly increase.

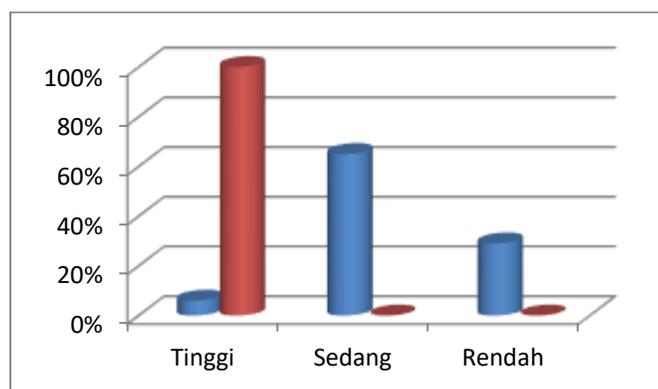


Fig 1.

IV. CONCLUSION

The application of discovery learning to children's natural intelligence about the environment before being given treatment is considered to be in the medium category. At the time this study was given treatment the application of discovery learning to naturalist intelligence of children has increased. Thus there are significant differences where there is an increase in the naturalist intelligence of children after the implementation of discovery learning.

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