Introduction of the Surrounding Environment to Stimulate Naturalist Intelligence of Early Childhood

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Abstract. The purpose of this study is to stimulate the naturalist intelligence of early childhood through the introduction of the surrounding environment. The sample in this study was 10 children aged 5-6 years in group B in a kindergarten in Padang. This research uses a quantitative approach with a pre-experimental type and the design used is one group pretest-posttest. Data collection was obtained from observation and documentation, then the data was processed using paired sample t-test analysis techniques. The results showed that the introduction of the surrounding environment can stimulate the naturalist intelligence of children aged 5-6 years. This is known from the results of the paired sample t-test obtained, where the significance value of 0.025 is smaller than the error level of 0.05 (0.025 < 0.05). Based on these results it can be stated that Ho is rejected and Ha is accepted which means the child's naturalist intelligence increases with the introduction of the surrounding environment.

1. Introduction

Education must be done early, starting from early childhood education (ECE) because of the critical period for children to develop all their potential and aspects of child development called an early age. The development obtained during this period is very influential to the children's further development. Early childhood is also a golden period for children, which cannot be repeated [1]. Therefore, the children should be developed as well as possible. At this time, the children's brain development will influence much on children's other development aspects. Since humans' brain development is 50% achieved until their age turn 4, 80% is achieved when they turn 8, while 100% is achieved when they turn 18 [2]. Therefore, it is very important to stimulate children's intelligence at an early age.

Intelligence is a set of skills, talents, and abilities which independent of each other, and potentially exist in every human [3]. Furthermore, in 1983, Howard Gardner developed a theory known as multiple intelligences [4]. The multiple intelligences theory was developed into nine intelligences, since each individual has a unique way to solve problems, and they cannot be judged on only one or two aspects [5]. In line with Lou and Mindy (2019) intelligence can be used as a human capacity to acquire and apply more knowledge and skills [6]. One of the intelligence which is needed to be stimulated to children is naturalist intelligence.

Naturalist intelligence is the intelligence possessed by humans to recognize and divide various types of flora, fauna and utilize certain features of the environment. Naturalist intelligence is closely related to the sensitivity in respecting nature and the environment, so it can make everyone take care
of the environment [7]. In line with research Ningrum, et al (2018) that naturalist intelligence has a significant impact on environmental awareness, and can develop positive attitudes towards the environment. The children's development is not only influenced by hereditary factors, but the environmental factors surrounding the child also affect so that the child's naturalist intelligence is important to develop [8]. Naturalist intelligence is also interpreted with knowledge based on information through sharp observations in distinguishing, discovering, detecting relationships between plants, animals and other components in nature [9]. The problem is the child's naturalist intelligence has not developed optimally because almost all children still show their lack of attention to the surrounding environment. Seen by there are still children who do not know anything in the surrounding environment such as knowing plants, which is something that is often encountered and seen by children in the surrounding environment. Also, children are still unable to enjoy the nature around them which provides great potential as a learning tool.

Naturalist learning emphasizes the direct experiences to develop competencies so that children can see and understand the surrounding environment in a real way. There are so many ways that can be used to develop and stimulate the children's naturalist intelligence such as involving the children in several activities outside home and school by introducing natural objects that are around the child [10]. The introduction of the surrounding environment necessary to be conducted at an early age, since the environment can give joy to the children [11]. The environment is an interesting learning resource for children since they will be freer to improve and explore their creativity, especially in discovering and creating new things. Children can learn from their closest environment, which is a natural environment [12]. The natural environment is important literature for developing children's abilities because it can teach children to interact with the natural surroundings [13]. Besides that through nature children can play, talk, listen, write like drawing and many values and knowledge that can be developed [14]. In various countries, since 2003 environmental education has become a compulsory component of school and university curricula to create awareness and sensitivity to nature from an early age [15]. This is also supported by the results of research by Vardin (2003) who compared the theories of human development Maria Montessori and Gardner that the environment plays an important role in human development [16].

By introducing the environment to children, parents and teachers have stimulated the children's naturalist intelligence indirectly, since, in early childhood, learning which is conducted near the environment is still rarely applied. Hence, children's naturalist intelligence needs to be stimulated to support development. Research conducted by Hartika, et al (2019) revealed that there was a positive and significant relationship between naturalist intelligence and environmental attitudes, while the higher children's naturalist intelligence, the better children's environmental attitude [17]. Therefore, children's naturalist intelligence can be stimulated by implementing the most appropriate way, such as introduce the surrounding environment. The introduction of the surrounding environment is necessary to make them recognize the things around them such as plants, which are often found by the children. Children will mention the names and characteristics of the plants that are around them, and they can group them into several types, which make them aware and take care of the environment. Furthermore, the children can preserve the environment, take care of the environment, and treat the environment well by repairing and preventing some damages. This reveals that children have naturalist intelligence well.

2. Method
This study implemented a quantitative approach with a pre-experimental type. The design used is a one-group pretest-posttest to show the naturalist intelligence of children can be improved through the introduction of the surrounding environment by comparing conditions before being treated. Data collected through observation and documentation. This research analyzes data through normality tests, homogeneity test, and paired sample test.

Sampling in this study uses a purposive sample. A purposive sample is taking a sample by taking subjects based on objectives [18]. The sample in this study amounted to 10 children aged 5-6 in group
B in a kindergarten in Padang. The instruments in this study used teacher-made tests in the form of four items consisting of oral tests and deeds tests. The instrument is used to facilitate research and the results are more accurate, complete, and systematic so that the data is more easily processed. Research instruments are tools that are used by researchers to collect data by measuring [19]. Naturalist intelligence instrument is a tool to measure children's naturalist intelligence. The following instrument lattices are used in this study:

| Variable               | Sub-variable | Indicators                                                                 |
|------------------------|--------------|-----------------------------------------------------------------------------|
| Naturalist Intelligence| Introducing  | Introducing the plants in the environment                                   |
|                        | Mentioning   | Mentioning the plants in the environment                                    |
|                        |              | Mentioning the characteristics of plants in the environment                |
|                        | Grouping     | Grouping the plants which belong to similar types                           |

The data was obtained by examining and assessing the results of the pre-test and post-test by using checklists format, adopted from the assessment criteria for Early Childhood Education (ECE) curriculum, consisted of four assessment criteria. The criteria for this research developed very well which was given 4 scores, develop as the expectations which were given 3 scores, starts to develop which was given 2 scores, and has not developed was given 1 score. The instruments could be used after validity and reliability tests.

2.1. The hypotheses are as follows:
Zero Hypothesis (Ho): The introduction of the surrounding environment cannot stimulate the naturalist intelligence of children aged 5 to 6 years old, with a significant level of 0.05.
Work Hypothesis (Ha): The introduction of the surrounding environment can stimulate the naturalist intelligence of children aged 5 to 6 years, with a significant level of 0.05.

3. Results and Discussion
The purpose of this study focuses on stimulated the naturalist intelligence of children aged 5 to 6 years through the introduction of the surrounding environment with a paired sample test analysis to formulate the final results.

3.1. Results
The results of this study indicate an increase in naturalist intelligence in children through the introduction of the surrounding environment by the teacher. The data of this study were obtained from observations aimed at children obtained through the documentation of several photos and videos. Then the data were analyzed using the normality test, homogeneity test, and paired sample test to determine and show differences before and after being treated. The following data are the results of the pretest and post-test in table 2:

| N=10 | Naturalist Intelligence in Children 5-6 Years |
|------|-----------------------------------------------|
|      | Minimum | Maximum | Mean   | Std.Deviation |
| Pretest | 56       | 75      | 63.75  | 6.455         |
| Post-test | 75       | 94      | 85.62  | 7.247         |

From the table above shows the naturalist intelligence of children before being treated has a low average of 63.75. While the naturalist intelligence of children after being treated through the introduction of the surrounding environment has increased to an average of 85.62 for 10 children.
3.1.1. Validity and Reliability Test
This research can be started if the validity and reliability test of the instruments have been conducted. The validity and reliability tests were conducted in different kindergartens, yet have similar characteristics, such as the children should be 5 to 6 years old. The reliability of this study used 10 kindergarten children, which were 5 to 6 years old.

| Table 3. The Result of The Analysis of Children's Naturalist Intelligence |
|-----------------------------------------------|
| Indicators of the Instrument | Correlation Coefficient | Explanation |
| Introducing the plants in the environment | 0.908 | Valid |
| Mentioning the plants in the environment | 0.666 | Valid |
| Mentioning the characteristics of plants in the environment | 0.952 | Valid |
| Grouping the plants which belong to similar types | 0.828 | Valid |

Based on the validity results, the scores obtained from four items with N = 10 are considered as valid, with a correlation level of 0.632, which has been adjusted to the product-moment correlation table. Therefore, all indicators could be used in the data collection of this study.

The instrument reliability test was conducted using the alpha Cronbach formula. The alpha Cronbach formula was used to find the reliability of instruments whose scores based on the ranges (for example 0-10 or 0-100) or a scale of 1-3, 1-5 or 1-7, and so on. Based on the alpha Cronbach formula used, the score of the instrument reliability test was 0.85. It was within the interval of the reliability coefficient of 0.80 < r11 < 1.00. Therefore, it can be concluded that the reliability of the instrument was very high.

3.1.2. Pre-requisite Test

| Table 4. The Results of the Normality Test |
|------------------------------------------|
| Naturalist Intelligence | Kolmogorov-Smirnov* | Shapiro-Wilk |
|                          | Statistic | Df | Sig. | Statistic | df | Sig. |
| Pretest                  | .171      | 10 | .200 | .896      | 10 | .196 |
| Posttest                 | .202      | 10 | .200 | .878      | 10 | .124 |

From table 4 above, it can be seen that before and after being treated, the introduction of the surrounding environment to stimulate the naturalist intelligence of children has normally distributed data using the Kolmogorov-Smirnov and Shapiro-Wilk formulas with the help of SPSS.16 windows, where the data are normal if p> 0.05.

| Table 5. The Results of the Homogeneity |
|----------------------------------------|
| Naturalist Intelligence | Levene Statistic |
|                          | Statistic | df1 | df2 | Sig. |
|                          | .158      | 1   | 18  | .696 |

From table 5 above it can be seen that the significance value (sig) of naturalist intelligence is 0.696 which means more than 0.05 (0.696> 0.05), it can be concluded that the variant of data using the Levene Statistic formula with the help of SPSS.16 windows proves to be homogeneous. This is because the data is called homogeneous if p> 0.05.

3.1.3. Hypothesis Testing
From table 6 above, it can be seen that the paired sample t-test obtained a significant value that is 0.025 smaller than the error level of 0.05 (0.025 < 0.05). Based on these results it can be stated that Ho
was rejected and Ha was accepted. So the introduction of the surrounding environment can stimulate the naturalist intelligence of children aged 5-6 years.

**Table 6. The Results of Paired Sample t-test**

| Naturalist Intelligence (pretest-posttest) | Paired Differences |
|------------------------------------------|--------------------|
| T            | df  | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference |
|--------------|-----|-----------------|-----------------|-----------------------|-----------------------------------------|
| 2.689        | 9   | .025            | 8.750           | 3.354                 | 1.388 to 16.112                          |

3.2. Discussion

Learning by utilizing the surrounding environment needs to be applied to early childhood. Learning resources that are close to children are the surrounding environment such as the natural environment, children will often meet with whatever is in the surrounding environment. Through the surrounding environment, many things that children can learn like children will care about the surrounding environment. Children's concern for the environment is also called naturalist intelligence. Naturalist intelligence is understanding, classifying and explaining things that are encountered in the natural world. "That is, naturalist intelligence is the ability to relate to nature [20]. Hayes (2009) also defines naturalist intelligence as the potential to process information that exists in nature [21]. It is important to integrate naturalist intelligence activities in teaching to help student learning because naturalist intelligence has ranked first among other intelligence that must be given to children [22]. This is proven by the results of research (Sener and Çokçaliskan 2018, Zebari et al. 2018) that the assessment of naturalist intelligence is better compared to other intelligence in school and university students [23][24].

Introduction to the surrounding environment influences in stimulating the naturalist intelligence of early childhood. Introduction to this surrounding environment will help children in recognizing and knowing what features are available in the surrounding environment. Budingsih et. al (2018) also showed that the environmental learning model can improve clean and healthy living behavior [25]. The environment as a source of learning is very suitable and effective to be used to stimulate the naturalist intelligence of children aged 5-4 years. In early childhood learning the teacher should provide a real learning resource so that it makes it easy for children to understand and comprehend the activities carried out. By seeing directly the child will easily remember the activities taught by the teacher, especially in stimulating the child's naturalist intelligence. Naturalist intelligence as a human ability to recognize, understand and appreciate what is in the universe such as plants, animals and other parts of the universe so that with the introduction of the surrounding environment in children, the internalization of naturalist values will be very easily absorbed and applied by children. Therefore, children need to be closer to the surrounding environment so that children's naturalist intelligence can be stimulated properly.

Based on the calculation of the pretest and posttest scores of children's naturalist intelligence before being treated has a low average of 63.75. While the naturalist intelligence of children after being treated through the introduction of the surrounding environment has increased to an average of 85.62 for 10 children. The paired sample t-test results obtained also prove that the significance value of 0.025 is smaller than the error level of 0.05 (0.025 <0.05). This means that Ho is rejected and Ha is accepted so that the introduction of the surrounding environment influences stimulating naturalist intelligence of children aged 5-6 years. This finding is different from the previous findings, where Hasanah, et al. (2019) showed that through gardening activities can improve the naturalist intelligence of children in group A in TK Pembina Merauke with the results of the percentage of naturalist intelligence in cycle I of children who have reached the developing criteria as expected, an increase of 28% from the initial condition of 48%, increasing to 76%. The increase in the percentage of naturalist intelligence in the second cycle was 12% from the first cycle from 76%, increasing to 88% [26]. But in
reality, not only gardening can increase naturalist intelligence. With the introduction of the surrounding environment, it has also been proven to stimulate naturalist intelligence in early childhood. This is in line with research by Wulansari and Sugito (2016) that natural-based learning models are very well developed for early childhood because they can accommodate the characteristics of children. In the process of learning physical spontaneity, social spontaneity, cognitive spontaneity, joyful content, and a sense of humor children develop well [27].

Learning excellence with an introduction to the environment can also foster children's creativity. Children's imagination will be conveyed spontaneously so that children's learning opportunities will increase. Research Kiewra et al (2016) shows that four factors can enhance children's creativity and imagination by learning in the surrounding environment, namely (a) predictable space, (b) adequate and consistent time, (c) open material, and (d) care [28]. That way, the teacher must be able to use the environment as a source of learning for children in improving all aspects of development in children. The surrounding environment is not a learning resource that is difficult to apply, it is very close to the child and in daily life, the environment is often encountered by children.

4. Conclusion
This study concludes that the introduction of the surrounding environment can stimulate the naturalist intelligence of children aged 5-6 years. It can be seen from the paired sample t-test that has a significance value of 0.025 <0.05 which means that Ho is rejected and Ha is accepted. The introduction of the surrounding environment is done by inviting children to go directly into the environment then the teacher will stimulate the child with questions and answers about plants around the child. That way, children know the plants that are often found, this question and answer habit needs to be given to children so that children remember this until they are adults.

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