School Environmental Exploration Learning in Improving Science and Mathematics Abilities in Early Childhood in DA Cokroaminoto 02 Gemuruh Kindergarten, Banjarnegara District

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Abstract: Based on research conducted at TK DA Cokroaminoto 02 Gemuruh, Banjarnegara Regency, science and mathematics learning still uses learning media that tend to focus on magazines or books. Therefore, this study aims to determine the increase in science and mathematics skills in early childhood. This study uses a quantitative method with Pre-Experiment. This study uses a One Group Pretest-Posttest Design. Data analysis techniques used normality tests, average increase tests (N-Gain) and average difference tests (t-test). The data analysis techniques used are descriptive analysis, hypothesis testing through the Paired Sample t-Test and the N-Gain Test. All calculations were performed using SPSS IMB 26. The science and mathematics ability before being given treatment was 51.75 then after being given treatment of school environmental exploration learning increased to 95.50. The amount of increase before and after being given treatment was 43.75. Based on statistical calculations through the Paired Sample t-Test, it shows that the calculated t must be smaller than the t table (t calculated < t table) and sig <0.05. The results show that the calculated t <t table is -22.682 <2.093 and sig 0.000 < 0.05 so that Ha is accepted. Based on the results of the N-Gain test, it was obtained as much as 0.9073 which means there is an average increase in the pretest and posttest scores with a high category. The conclusion in this study is that environmental exploration learning is effective in improving science and mathematics abilities in early childhood.

Keywords: Environmental exploration learning; science skills; mathematics

INTRODUCTION

Education is one of the important factors in forming a person's character and abilities. One of the important aspects of education is the learning of science and mathematics. However, in practice, many children still have difficulty understanding these concepts. Therefore, a learning method is needed that can improve children's science and mathematics abilities. One of the learning methods that can be used is environmental exploration learning. This method allows children to learn actively by observing and exploring their surroundings. Introduction to science and mathematics should be done since early childhood with fun and not boring activities. The purpose of environmental exploration is to utilize and seek new experiences in the natural environment around the child, which directly involves the child and the child can also benefit from games and information or explanations that are easy for the child to understand.

Introduction to science and mathematics can be introduced to children directly by exploring various inanimate and living objects around the school environment, besides that it can also train children's five senses to recognize various phenomena of objects and events. According to (Ratni Oktaviyani, 2021) Science is a science about the environment and oneself. Science that is introduced from an early age can encourage them to become children who are creative, inspired, initiative, and foster logical thinking patterns in children. According to (Umboh et al., 2022) in early childhood science is not just a collection of facts, but involves activities such as predicting what will happen, even if only in small amounts, distinguishing or testing information, predicting what will happen through informed

activities and then being able to draw conclusions.

Early childhood science skills are the skills or abilities possessed by children to study and master the natural environment around them which are obtained through the process of getting to know, observing and conducting experiments (Wanci Refianti, 2022). Science learning emphasizes direct experience so that it is necessary to be assisted in developing science process skills so that they can understand the nature around them. According to (Lubis & Umar, 2022) Mathematics is one type of knowledge that humans need in carrying out their daily lives. Mathematics learning for early childhood is light and simple learning using easy contexts in the everyday environment.

Environmental exploration learning activities train children's ability to explore and build their own knowledge by observing and discovering new things obtained in their environment. In exploration, children can use their five senses to see, feel, touch, smell, mix and compare.

However, in reality in the field, especially science and mathematics learning in environmental exploration learning activities needs to be implemented in DA Cokroaminoto 02 Gemuruh, Banjarnegara. The learning conducted in the school tends to use the " Teacher Oriented" method or the teacher still introduces the learning in the classroom such as writing activities, or coloring and centered on magazines. Environmental exploration learning is applied with the aim that learning that can be done to introduce science and mathematics to children is not only done in the classroom, but can also be done outside the classroom, with the intention that children do not get bored, play an active role in asking questions and can be more focused if the atmosphere provided is comfortable and interesting. Thus, the application of environmental exploration learning in improving science and mathematics skills in early childhood has an important role.

METHODS

The method used in this research is the quantitative method. This research uses an experimental method. In the experimental research method there is treatment. There are several forms of experimental design, in this study the researcher used Pre-Experimental Design with the One-Group Pretest-Posttest Design method. The focus of this research is to improve science and mathematics skills in environmental exploration learning around schools. The population in this study was all class B children at DA Cokroaminoto 02 Gemuruh. The sampling technique used the "Purposive Sampling" technique. The use of this technique was taken by children aged 5-6 years, male and female in DA Cokroaminoto 02 Gemuruh. The study was conducted to obtain valid data, so it is necessary to determine the appropriate data collection technique. This research technique uses observation, interviews, tests, research instruments and documentation. Then data validation is carried out to prove that the research conducted is truly scientific research to test the data obtained. To conduct data validity testing in quantitative research includes validity testing, reliability testing, normality testing, hypothesis testing, and n-gain testing. Data analysis in research is a process carried out after data from various sources.

RESULT AND DISCUSSION

RESEARCH RESULT

1. Normality Test

Based on the output results of SPSS version 26, it is known that the Sig value for the pretest score is 0.027 and the Sig value for the posttest score is 0.074. Because the Sig values of both are >

0.05, it can be said that the data on science and mathematics abilities before and after being given environmental exploration learning treatment are normally distributed.

2. Hypothesis Testing

Based on data obtained through statistical calculations using the Test Paired Sample t-Test then the Sig.(2-tailed) value is 0.000 < 0.005, then Ho is rejected and Ha is accepted. The data obtained shows that the calculated t value is -22.682. To see the results of the hypothesis calculation can be accepted then the calculated t value must be smaller than t table (t count <t table) and sig < 0.05. The results show that t count - 22.682 <t table -2.093, then it can be concluded that Ho is rejected and Ha is accepted, so there is an influence in the use of environmental exploration learning in improving science and mathematics skills in early childhood in class B TK DA Cokroaminoto 02 Gemuruh.

3. N-Gain Test

Based on the N-gain data results of 0.9073, which means that N-gain 0.9073> 0.7 can be categorized as high. Then to see the N-gain Score in the form of a percentage of 90.73 and can be categorized as effective because> 76%. Therefore, from the data results above, it can be concluded that environmental exploration learning is effective in improving science and mathematics skills in early childhood.

4. Descriptive Analysis

Based on the results that have been known that there is an increase in the Pretest and Posttest values in science and mathematics abilities after the implementation of environmental exploration learning. The results of the average value of science and mathematics abilities (pretest) were 51.75 after the environmental exploration learning treatment (posttest) was 95.50 which can be interpreted that there was an increase in the results of the pretest and posttest with a difference of 43.75.

Childhood Science and Mathematics Skills at DA Cokroaminoto 02 Gemuruh Kindergarten, Banjarnegara Regency" are further explained in the discussion. The discussion of this study examines the effectiveness of environmental exploration learning in improving science and mathematics skills in early childhood and improving science and mathematics skills before and after being given environmental exploration learning. This study was conducted in class B as an experimental class consisting of 20 children aged 5-6 years.

DISCUSSION

1. The Effectiveness of Environmental Exploration Learning in Improving Science and Mathematics Skills in Early Childhood

The effectiveness of environmental exploration learning in improving science and mathematics skills in early childhood can be seen through pretest and posttest data. This research trial was conducted on 20 class B children at DA Cokroaminoto 02 Gemuruh Kindergarten. After conducting the test, the results of the pretest and posttest scores were obtained and then the results were analyzed to determine the effectiveness of environmental exploration learning to improve science and mathematics skills in early childhood. The results of the pretest score data with an average of 51.75, and a posttest value of 95.50 with a difference of 43.75. The results of the pretest and posttest analysis showed that school environmental exploration learning affects science and mathematics skills in early childhood, so that school environmental exploration learning is effective for improving science and mathematics skills in early childhood.

2. Improvement of Science and Mathematics Skills Before and After Implementation of Environmental Exploration Learning

Environmental exploration learning in improving science and mathematics skills in early childhood is done by learning outside the classroom, such as in the back yard and front yard of the school by preparing tools for mathematics learning such as blocks, rulers, scales, measuring instruments, meters, etc. Science and mathematics learning for children that is done by exploring the environment makes it easy for children to understand new things that are obtained such as science learning children can plant plants, look for objects in the backyard such as leaves, stones then children can group these objects, distinguish textures such as smooth, rough, thick, thin using sand and flour, etc. Like science learning, mathematics can also be done outside the classroom such as in the back yard or front yard of the school, mathematics learning is done by sorting numbers, counting numbers using twigs/leaves/stones, this makes it easier for children to do addition and subtraction operations, write numbers on flour/sand, introduce geometry using objects around or using geometric shapes and use measuring instruments such as scales, rulers, and measuring instruments. The provision of environmental exploration learning gets enthusiasm from class B children, they feel happy and motivated to learn more enthusiastically. In this study, environmental exploration learning in improving science and mathematics skills, can be seen from the results of data measured using IBM SPSS version 26, that science and mathematics skills after treatment have increased, the pretest value produced is 51.75 while the posttest value is 95.50. Therefore, the difference between the pretest and posttest values is 43.75. Therefore, it can be concluded that environmental exploration learning in improving science and mathematics skills in early childhood has increased, this can be seen from the pretest and posttest values.

CONCLUSION

Based on the results of the research and discussion in the previous chapter, it can be concluded that after being given treatment through environmental exploration learning, it has increased and is effective. Exploration learning allows children to learn actively by observing and exploring their surroundings. This can be used for science and mathematics learning in children of this age, that this learning can not only be done in the classroom but can also be done outside the classroom.

Introduction to science and mathematics can be introduced to children directly by exploring various inanimate and living objects around the school environment, in addition to that, it can also train children's five senses to recognize various phenomena of objects and events.

The suggestion that can be conveyed is that teachers can utilize the school environment as a learning environment, because this is effective and good for children because children can discover new things and carry out direct experiments. And try not to focus on children's worksheets or magazines as learning media.

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