

Experiential Learning Methods to Improve Young Children's Science Process Skills During Covid-19 Pandemic

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ABSTRACT

The research objective was to determine the effect of experiential learning methods on early childhood science process skills in the Covid-19 Era. This research is a pre-experimental design using one group pre-test & post-test design. This data collection technique uses observation, interviews, and documentation. The research subjects were 12 children, consisting of 7 boys and 5 girls aged 5 years. The score of the initial observation of children's science process skills before the experimental method was carried out was 232 with an average of 19.33, the highest score of 22, the lowest score of 16, and SD = 2.31. The final observation score of early childhood science process skills after experimenting with the experimental method was 313 with an average of 26.08, the highest score was 30, the lowest score was 20, and SD = 3.31. Based on these data, it can be obtained count = $10.16 \leq \text{table} = 1.79$ counts can be seen through SPSS 22 for windows analysis and the t table can be seen through the t distribution critical value table with df or DB = 11 and $\alpha = 0.5$. So it can be concluded that even though in the Covid-19 era the experimental method affected early childhood science process skills at TK Da'arurahma Majalaya Academic Year 2019/2020.

Keywords: *Experimental method, science process skills.*

1. INTRODUCTION

The Covid-19 pandemic has an impact on the world of education, including early childhood education. The existence of this coronavirus outbreak hinders teaching and learning activities that usually take place face-to-face. Even so, this pandemic was able to accelerate education 4.0. The learning system is carried out remotely by utilizing information technology. However, there are great challenges in implementing the distance learning model, education must still change individual behaviour in a controlled environment or a positive environment that is created through interactions with the closest people and can be grown through a harmonious relationship between parents and children, teachers and students, and child's relationship with friends. This can be used as a foundation for achieving educational goals designed through early childhood education the effort aimed at children aged zero (0) to six (6) years which is carried out through providing educational stimuli to assist physical and spiritual growth and development so that children have the readiness to enter further education [1], [2].

The goal of PAUD according to Permendiknas No 58: 2009 can be achieved by optimizing all aspects of child development. Five aspects of development must be developed, namely language development, religious and moral values, social-emotional, physical motor skills, and cognitive development. Of all the existing aspects, aspects of cognitive development are the main aspects that can influence the development of other aspects [3], [4]. There are various children's cognitive abilities that must be developed, starting from the concept of numbers, symbols of numbers, letters, shapes, sizes, patterns, colours, and science.

The basic competency of learning science that children must have is to be able to recognize simple concepts and science process skills related to children's daily lives. Science process skills for early childhood include observation, classification, comparing, measuring, communicating, experimenting, arguing, applying, and relating.

PAUD is growing so rapidly that currently, the Indonesian government pays very special attention to early childhood education. Early childhood has the characteristics that are happy to explore their environment, exploration, great curiosity, spontaneous

nature, like adventure, like to experiment, have high imagination [5]. One way to stimulate early childhood development is by providing creative, innovative teaching and education and creating an interesting and fun learning atmosphere in early childhood. In providing creative, innovative learning, one way is to use experimental methods for an event [6]. That way children can understand the process of the activities given, understand scientific concepts, and of course support cognitive abilities. Children in science learning skills.

Children build knowledge through a process of interaction that they go through in the environment around where the child lives. Children's knowledge is built by combining children's experiences they have had before with new experiences they have had [7]. Human life is so close to science and nature, that various developments lead to and contain science, and education is no exception. Education containing science can be seen at various levels of education. One of them is in early childhood education. PAUD is currently increasingly academic and leads to the development of science and mathematics, and many institutions have included learning science and mathematics in the learning process [8], [9]. The introduction of science in early childhood is very important for children because when children interact with various objects of science, children see science as something that is extraordinary, something that is found and considered interesting, and provides knowledge or stimulates it to know and investigate it.

The experimental method is a way of providing experiences to children where children treat something and observe its consequences [10]. The experimental method makes students more confident about the results they get because they are involved and experienced directly in an experiment. By using the experimental method, children will find it easier to understand and understand a problem they face than children who only receive information from educators without experiencing it directly. Learning using the experimental method, the teacher invites children to discuss procedures, equipment, and materials for experiments as well as things that need to be observed during the experiment then provides an explanation accompanied by examples [11].

Cultivating the scientific process carried out by learning is not very difficult, because science for early childhood comes from a simple environment. Like when a child tries something to get to know the environment, it can be said to be a scientific process. Simply put, the science learning process does not make the learning process not properly facilitated. The implication is how learning or method in the educational process is able to optimize the development or life skills of children.

2. METHOD

This type of research is quantitative research with a quasi-experimental approach. Quasi-experimental or quasi-experimental is experimental research in which not all variables and experimental conditions can be strictly regulated and controlled [12], [13]. This form of research is widely used in the field of education or other research. In this study, what was tested for its effectiveness was the effect of experiential learning methods on the ability of science process skills in early childhood at Da'arurrahma Majalaya Kindergarten in the 2019/2020 school year. This study used a post-test only control group design.

In this study, the population is defined as the number or unit of individuals who have several similarities or traits, and it is to them that the conclusions of this study are given. The population in this study were all children of group B TK Da'arurrahma Majalaya in the 2019/2020 school year.

3. RESULTS AND DISCUSSION

Based on preliminary observations, generally learning in PAUD is good, but it still needs to be optimized through new variations, one-sided information learning with the lecture method must be reduced, where this method makes children less enthusiastic in participating in learning and other methods of playing while learning is sought.

Lecture learning is only carried out by explaining through worksheets which are then continued by working on the worksheet, there is no active involvement of children in building their knowledge, making children less visible in observing, trying, and communicating skills in a learning process. This is when educators ask when recalling activities about the subject matter they cannot answer correctly.

Table 1. Data before Experimentation in Early Childhood Science Process Skills Research

Interval	Frequency	Percentage (%)	Category
<12	-	=	Undeveloped
≥ 12 – 20	5	41.66%	Beginning to Develop
≥ 20 - 28	7	58.33%	Develop as Expected
≥ 28	-	-	Very Well Developed
TOTAL	12	100%	

Based on table 1 that before the experiment was carried out, there were no children who had scientific skills with the underdeveloped category with an interval of <12, there were 5 children who had science process skills with the category starting to develop with an interval of ≥ 12-20 and a percentage of 41.66%, there were 7 children who have science process skills in the

category of developing according to expectations with an interval of $\geq 20-28$ and a percentage of 58.33%, and no child has developed very well at an interval of ≥ 28 .

We can be seen that the total score of all children after the experiment is 313, with an average of 26.08, with the highest score of 30 and the lowest score of 20. Developmental scores are categorized into 4, namely: underdeveloped, starting to develop, developing as expected, and developing very well. The following is the table and histogram of the results of categorizing children's science process skills after the experiment:

Table 2. Data after Experimentation in Early Childhood Science Process Skills Research

Interval	Frequency	Percentage (%)	Category
<12	-	=	Undeveloped
$\geq 12 - 20$	1	8.33%	Starting to Develop
$\geq 20 - 28$	8	66.67%	Develop as Expected
≥ 28	3	25%	Very Well Developed
TOTAL	12	100%	

Based on table 2, after the experimental results of early childhood science, process skills were not developed, there was 1 child who had science process skills with the category of starting to develop with an interval of $\geq 12-20$ and a percentage of 8.33% and 8 children were developing according to expectations with an interval of $\geq 20-28$ and have a percentage of 66.67% and there are 3 children who have science process skills with very well developed categories with an interval of ≥ 28 and a percentage of 25%.

The results of data analysis using the t-test obtained a t count of 10.16. While the t table can be obtained through the t distribution critical value table with the value of DB or $df = 11$ and $\alpha = 0.05$ which indicates the t table of 1.79. Based on the comparison between count and table, it can be seen that. The value of count $10,161 \leq$ table is 1.79, so H_0 is rejected and H_a is accepted, it can be concluded that there is a significant effect of experimental methods on early childhood science process skills at TK Da'arurahma Majalaya Academic Year 2019/2020.

The stimulation of scientific process skills can be provided with experimental activities, one of which is volcanic experimentation. This activity trains children to think about the cause and effect of what happens when a volcano erupts. This experimental activity can increase children's interest in learning science. In this volcano experimental activity, children are asked to observe what causes a volcano to erupt and what results are caused when a volcano erupts. This experimental activity will train children's discipline because each time they will start the experiment it begins with a learning contract. This research provides stimulation and motivation to

children so that children feel happy and enthusiastic about participating in these activities. Based on the comparison of the initial and final results, it can be seen that the results of the final observations are higher than those of the initial observations, all the children experienced an increase in science process skills. This supports the hypothesis which states that the experimental method significantly affects early childhood science process skills.

4. DISCUSSION

The use of the experimental method applied was the Mount experimental activity. Explosive mountain experiment activities have an influence on children's science processes such as observing (observation), classifying (classifying), predicting (predicting), concluding (inference), communicating, using tools and measurements, planning research to apply. In line with this, children when learning using the experimental method are instinctively active and immediately observe things that are in front of them, including when carrying out experiments on erupting mountains. Carrying out the eruption mountain experiment activities attracts children's attention and spontaneously fosters children's curiosity, so that from this curiosity the child's ability to observe, classify, predict, and communicate emerges. Carrying out science experiments children actively learn and observe experimental activities and participation with other children [11]. In this way, children from an early age actively build various understandings from their experience of carrying out experiments, so that children's science processes such as (observing, classifying, predicting, concluding, and communication) can develop.

Conducting experimental activities carried out in practice so that it can make it easier for children to understand various knowledge and purposes of delivering material. This is in line with the opinion that the experimental method is a learning activity that is carried out directly on children either individually or in groups because it is to train experiments in a process [5]. This is in line with what Yunansah said that early childhood needs to be involved in every activity, one of which is experimental activities so that it can provide lasting experiences to children so that it will facilitate the child's science and the process to develop properly, as children will be stimulated to observe things that happens, classifies something well, predicts something that has happened, and concludes something that he has seen. In the activity of the eruption mountain experiment, the children carry out the practice directly, the children try themselves starting when the child drops the vinegar solution so that the child's science process, such as observing directly occurs, the child looks enthusiastic and the child immediately investigates the events that occur and automatically other abilities become following

development the ability the language develops so that it makes it easier for children to get other information so that the ability of other children's science processes such as predicting and concluding develops

Based on the results of the study, that Covid-19 does not affect the development of the scientific process in early childhood, although learning switches to being carried out online and carried out in the homes of individual students, this does not dampen the enthusiasm of children to carry out volcanic eruption activities. The experimental learning method of the erupting mountain experiment is actually a method that really helps children in understanding the learning material provided, because children practice it directly, so that the experimental method gives a pleasant impression, making it easier to develop aspects of child development, especially children's science process abilities.

5. CONCLUSION

Based on the results of the study it was concluded that the experimental method had an effect on early childhood science process skills at TK Da'arurahma Majalaya Academic Year 2019/2020, although the learning was carried out online and carried out at each student's home, COVID-19 had no effect on the level the spirit of the child to learn. This conclusion is based on the results of the research data analysis that has been carried out, the results obtained from the initial observation score of early childhood science process skills before the experiment with the experimental method were 232 with an average of 19.33 the highest score was 22, the lowest score was 16 and $SD = 2.309$. The results of the final observation of children's science process skills after the experiment obtained a score of 313 with an average of 26.08, the highest score of 30, the lowest score of 20 and $SD = 3.31$.

Based on these data, it can be obtained count $10.16 \leq$ table 1.79, the count can be seen through SPSS 22 for windows analysis and table can be seen through the critical value table of the distribution of t with a value (df or $DB = 11$ and $\alpha = 0.05$ because the count value is $10.16 \leq$ table 1.79 then H_0 was rejected and H_a was accepted. So it can be concluded that the experimental method has an effect on early childhood science process skills at TK Da'arurahma Majalaya Academic Year 2019/2020 even though the implementation of learning is carried out online and carried out at the homes of each child.

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