

Improving Simple Science Ability to Recognize Water Properties in Early Children

Yusria^{1*}, Huda², Fiqi Nurmanda Sari^{3*}, Nurmalia Kasmadi⁴, Athena Miranda Adrian⁵

^{1,2,3,4,5}Department of Early Childhood Education. Faculty of Education and Teacher Center, UIN Sulthan Thaha Saifuddin Jambi, Jambi, Indonesia

Abstract

This research aims to determine the level of success of children's scientific skills before and after being given action through experimental methods for children aged 5-6 years. This type of research is classroom action research (PTK) by having steps including preparation (RPPH), implementing actions, observing / observing, and also reflecting at each meeting. This research was conducted in two cycles. Each stage of the cycle includes planning, implementing, observing and reflecting. The subjects in this study consisted of 12 children including 5 girls and 7 boys. Data collection techniques used were observation, documentation, and interviews. The results of data analysis showed an increase in Pre-cycle, Cycle I, and Cycle II respectively as follows: no child succeeded in achieving the development of simple scientific skills in Pre-cycle 0 children (0%). Furthermore, there were 3 children (25%) who succeeded in achieving simple science development in Cycle I. And 9 children (75%) who succeeded in achieving simple science development in cycle II. From the description above it can be concluded that through the experimental method can improve the scientific skills of children aged 5-6 years.

Keywords: Simple Science, Ability, Properties of Water

1. Introduction

RI Law No. 20 of 2003 concerning the National Education System Article 1 Paragraph 14 states that early childhood education is a coaching effort aimed at children from birth to the age of 6 years which is carried out through the provision of educational stimuli to assist physical and spiritual growth and development so that children have readiness in enter further education.

In the field of science, the basic competence that children must have is being able to recognize various simple concepts about the everyday life they experience. Introduction to science should be done from an early age with fun activities through habituation so that children experience the scientific process directly.

To support this process, the teacher must prepare the right method in learning. Early childhood requires a method that can make them interact directly with the activities carried out. In this case the teacher can use the experimental method.

According to Pauler (quoted Ali, 2005:36) science is a systematic and formulated science in observing material phenomena, and is based on observational discussions.

Piaget's theory of cognitive development explains how children adapt and interpret objects and events around them. Children learn the characteristics and functions of objects such as toys, furniture and food, and social objects. Applying Piaget's theory in science learning means maximizing the use of physical demonstration and experimental methods.

Knowledge is systematic or arranged in an orderly manner, generally accepted, in the form of a collection of data from observations and experiments. Activities in science are always associated with experiments that require skill and craftsmanship. Science is not just a collection of knowledge about objects or living things, but involves how to work, how to think, and how to solve problems.

According to Carson (quoted by Nugraha, 2005:14) science for children is everything that is amazing, something that is found and considered interesting and provides knowledge or stimulates him to know and investigate.

It can be concluded that science is the science of the universe obtained from observations by experts about

^{*}) Corresponding Author

E-mail: fiqinurmandasari@uinjambi.ac.id

the surrounding environment. According to Islam, the history of science existed before the earth was created. Earth, the universe and humans. After humans were created, the progress of science began to develop rapidly. According to world history, Greek experts contributed to the development of scientific knowledge. In the 2013 Curriculum for Education for Children aged 5-6 years, simple science is a branch of science that stimulates children to increase curiosity, interest, solve problems, so that thoughts and actions arise such as observing, thinking, and activating concepts or events (Asimov, 1995).

Simple science modification theory is quoted from the source Science Learning Strategies For Preschoolers and Early Elementary Schoolchildren. Simple science for early childhood is anything that is amazing, something that is found and considered interesting and is more focused on the process than the product or result. Skills in the process are simple and done by playing.

A complete guide to science education is useful for students to learn about themselves and the world around them. Science education emphasizes providing hands-on experience to develop competencies so that students are able to explore and understand the natural surroundings scientifically. Science education is advised to "find out" and "do", so that it can help students gain a deeper understanding of the natural environment.

Roestiyah (2001) assumes that the experimental method is a way of teaching when students experiment about something, observe the process, and write down the results of the experiment then the results of the observations are conveyed to the class and evaluated by the teacher.

Based on the above definition, it can be concluded that the experimental method aims to make students able to find and find various answers or problems they face by conducting their own experiments. In addition, students can also be trained in scientific thinking. With experiments, students are able to find evidence of the truth of a theory they are studying.

The Qur'an in several verses gives encouragement to humans to conduct experiments, observe and think about the signs of Allah's power in the universe. This is explained by Allah Subhanahu wa Ta'ala in the Qur'an Surah Al-Ankabut verse 20.

Meaning: "Say, Walk on (face of) the earth. So pay attention to how Allah created (man) from the beginning. Then Allah made it again. Verily, Allah has power over all things."

The attention of the Qur'an in calling on humans to experiment, observe, and think about the universe and the creatures in it, clearly hints at the attention of the Qur'an in calling on humans to learn, either through

simple experiments, observations of various things, practical experience in everyday life. day, or through interaction with the universe, various creatures and events that occur in it.

So, the conclusion of the experimental method is to conduct experiments with the aim of knowing the purpose of the results carried out. And allow children to tell stories after doing experimental activities. With the experimental or experimental method, children can receive subject matter easily, children do not feel they are learning because what is happening is attracting attention and makes children want to try it themselves.

There are several things that must be prepared by educators before carrying out science learning about the concept of water, one of which is to prepare media that can provide direct experience so that children's conceptual knowledge can increase (Hoisington, et al., 2014:73).

In early childhood science learning, it is necessary to fulfill aspects related to science learning including objectives, material support needed (tools, materials, media), child preparation, activity development, reinforcement and rewards, children's worksheets and evaluation (Nugraha, 2008:109).

Science activities that can be given to early childhood at the age of 5-6 years include recognizing motion, recognizing liquid objects, recognizing, recognizing scales or balances, playing soap bubbles, mixing colors and substances, recognizing elastic objects, playing with air, and doing simple experiments, recognizing fire or burning, recognizing ice, playing with sand, playing with sound, playing with magnets, and loving animals. The science material used in this paper is recognizing liquids, playing with water, and conducting simple experiments.

The properties of liquids (the properties of water) include having a fixed size, having an irregular shape following the container, being able to dissolve other objects, water can flow from a high place to a low place, water can seep through small gaps. Water has the wrong shape to follow the container, i.e. the water that is poured into the glass will follow the shape of the glass, when it is transferred to the bowl, the shape will change to the shape of a bowl. Water dissolves substances, for example, when making sweet tea, sugar will dissolve with water. Water flows from high places to low places this happens because of the influence of the earth's gravity, the earth's gravitational attraction carries the flow of water from mountain springs down the valley to the ocean (the lowest land). Water seeps into small crevices, for example, like watering flowers, then a dishwashing sponge that soaks up water.

From the above explanation is the nature of water is to follow the shape of a container of water to dissolve some substances, water flows from high to low. The material used by the researcher here is material that is easy for children to understand by using a simple experimental method, the child is expected to more easily understand what is in remembering the material presented.

According to Suyanto (2008), efforts to identify the properties of water should be carried out from an early age with fun activities and through experimental methods so that children experience the scientific process directly. This is done so that children not only know the results but also can understand the process of the scientific activities they do. Science allows children to explore various objects, both living and inanimate objects. Besides that, it can also train children to use their five senses to recognize various symptoms of objects and events. Therefore, the author wants to increase the ability to recognize the properties of water so that children can know the symptoms that occur in nature and with children's frequent exploration of science, children's curiosity to find a real truth will develop and the child's scientific attitude will emerge.

Playing water is one of the fun for children. From this pleasure, it can be used as learning material for teachers to improve cognitive abilities to recognize the properties of water in children. Various activities carried out in this study recognize the properties of water in children by conducting experiments, including:

- 1) Water flows from high places to low places
- 2) Water dissolves paper corn
- 3) Water can seep into small crevices by doing water experiments walk
- 4) Doing a walking water experiment

From the explanation above, it can be concluded how to introduce the properties of water to early childhood with fun activities and through experimental methods so that children experience the scientific process directly. This is done so that children not only know the results but also can understand the process of the scientific activities they do.

Based on the actions during the pre-cycle carried out by researchers at Raudhatul Athfal Bustanul Ulum Jambi by pouring water from a high place to a lower place, dissolving corn paper, the pre-cycle results were obtained for 12 children in Raudhatul Athfal Bustanul Ulum. Children seem to know new things which are marked by the enthusiasm of children with various questions.

The results of pre-cycle activities for 12 children in Raudhatul Athfal are 10 (83.33) children who have not developed, 2 (16.66) children who are starting to

develop 0 (0%), developing according to expectations 0 (0%), and those who are developing Very Good 0 (0%). From the observations that the researchers made at Raudhatul Athfal Bustanul Ulum, the learning activities that took place tended to be still calistung (reading, writing, arithmetic). In addition, teachers have not provided opportunities for children to explore directly. Activities that take place such as coloring and thickening pictures and writing. There are several Kindergartens or equivalent educational institutions that carry out learning focused on exploring students' activities rather than learning that only focuses on the teacher.

Based on the above observations, the researcher formulates the problem "can experimental-based learning activities to recognize the properties of water improve simple science skills in early childhood?".

The purpose of this study was to determine whether experimental-based learning activities to recognize the properties of water can improve the ability of simple science in early childhood.

2. Method

The research method used in this research is classroom action research. This classroom action research uses the Kemmis and Mc. Taggart which includes four stages, namely planning, action, observation, reflection. The research was conducted at Raudhatul Athfal Bustanul Ulum Jambi on September 03 - October 02, 2020. The subjects of this study were the children of group B Raudhatul Athfal Bustanul Ulum, totaling 12 children consisting of 5 girls and 7 boys. The classroom teacher is also the subject of this research.

The research data were collected using observation, interview, and documentation techniques. After the data is collected, data reduction, data presentation, and conclusion drawing or data verification are carried out.

Sources of data in this study were taken from primary data and secondary data. Primary data obtained from informants or people who can provide information about research data. This data is taken from the habits of principals, teachers, and students. The secondary data that the researcher took was based on supporting books.

3. Result and Discussion

Science as a process is also called science process skills or scientific process abbreviated which is a skill to study natural phenomena in certain ways to obtain and further develop that knowledge. According to Rustaman and Adrian (quoted by Nugraha, 2005: 125) science process skills are all the skills needed to acquire, develop, and apply concepts, principles, laws,

and scientific theories, both in the form of mental skills, physical skills (manual), and skills. social.

The child's assessment is given related to the child's simple science, namely: the child demonstrates exploratory and probing activities (such as what happens when water is spilled), solves simple problems in everyday life in a flexible and socially accepted way, applies knowledge or experience in new context.

According to Sumanto, et al. (quoted Putra, 2013:40) science is a systematic way of finding out about nature to master knowledge, facts, concepts, principles of the discovery process, and have a scientific attitude.

Experiment is a learning stage where children are asked to be active and provide opportunities for children to understand, find information about new knowledge or sciences in the surrounding environment. The conceptual indicators in this study are related to children's cognitive by conducting experiments to recognize the properties of water to improve early childhood science skills.

In applying the experimental method, the learning process is designed in such a way that students are able to follow the application of the experimental method, namely: Children pour water from top to bottom, Children dissolve red corn paper, children carry out walking water experiments, children experiment with water flowers.

The properties of liquids (the properties of water) include having a fixed size, having an irregular shape following the container, being able to dissolve other objects, water can flow from a high place to a low place, water can seep through small gaps. Water has the wrong shape to follow the container, i.e. the water that is poured into the glass will follow the shape of the glass, when it is transferred to the bowl, the shape will change to the shape of a bowl. Water dissolves substances, for example, when making sweet tea, sugar will dissolve with water. Water flows from high places to low places this happens because of the influence of the earth's gravity, the earth's gravitational attraction carries the flow of water from mountain springs down the valley to the ocean (the lowest land). Water seeps into small crevices, for example, like watering flowers, then a dishwashing sponge that soaks up water.

In the application of recognizing the properties of water, samples will be given in each cycle and will continue to be carried out during the research. By giving examples directly to children, they can explain how the properties of water (Sumanto, 2007: 14).

The indicators of children's research in Permendikbud Number 137 of 2014 regarding children's cognitive achievement are: in this case the level of cognitive achievement: the level of achievement of cognitive development of children aged 5-6 years, namely: showing exploratory and probing activities (such as what happens when water is spilled) .

Precycle

Before conducting the research, the researcher made observations to find out how the children's simple science learning at RA Bustanul Ulum. This pre-cycle activity was carried out on August 10, 2020, with 7 boys and 5 girls as subjects. Data collection was carried out during the learning process with an observation sheet containing indicators and descriptors to see about the simple science learning of children in class B1.

At this stage, researchers and collaborators observe children's simple science learning. It can be seen during the pre-cycle using the experimental method, namely pouring water from top to bottom using a plastic cup filled with water, then the child is asked to ask to pour water into an empty plastic cup. Next, the child is asked to observe and explain what is happening. The researcher asked the children whether the water flowed from top to bottom or vice versa.

Based on the results of observations made to children about simple science through experimental methods, it turns out that the simple science abilities of children aged 5-6 years at RA Bustanul Ulum are not yet optimal. The first activity is pouring water that has been filled in a plastic cup, then the child is asked to pour the glass that has been filled with water into the empty plastic cup. Next, the children were asked to pay attention to what happened when the water was poured into an empty glass, which was done by the children. The second activity, dissolve the corn paper by using two empty plastic cups filled with water and the other glass filled with corn paper then ask the child to pour the glass filled with water into the glass filled with corn paper then ask the child to stir the glass and Ask the child to see and tell the results.

Based on research, children's simple science skills are still low. The results of observations showed that there were 0 children in the Very Good Development category (0%), 0 children categorized as Developing according to Expectations (0%), 2 children categorized as Starting to Develop (16,66%), and categorized as Undeveloped as many as 10 children (83.33%).

In addition, the average score obtained by children is also still low, namely 47.9. Therefore, researchers began to conduct classroom action research to improve children's simple science skills.

Cycle I

Cycle I consisted of 2 meetings which were held on September 03 and September 10, 2020. In cycle I, children studied the theme of Water with the sub-theme of Water Use.

Based on the results of observations which are a description of children's activities during the learning process, discipline takes place as a whole, children's activities in the teaching and learning process have not been optimal. There is an increase in children's simple science abilities. Judging from the results of observations where children who are categorized as very well developed are 3 children (25%), children who are categorized as developing according to expectations are 3 children (25%), children who are categorized as starting to develop are 2 children (16.66%), and There are 4 children categorized as Undeveloped (33.33%). The average value of the first cycle is 67.7.

The actions given in the first cycle were able to improve children's simple science skills with the experimental method to recognize the properties of water, but the researchers again tested the child's success rate by continuing to cycle II. This is done to strengthen or believe that the experimental method recognizes the properties of water for the BI class Raudhatul Athfal Bustanul Ulum Muaro Jambi because in Cycle I showed progress but the results were not as optimal as expected. Therefore, the researcher continued the action to cycle II.

Cycle II

Based on the results of observations which are a description of student activities during the learning process, overall student activities in the teaching and learning process are quite optimal.

The results of the evaluation to improve children's simple science skills through the experimental method to recognize the properties of water in cycle II, students have experienced an increase as expected. Based on the analysis of activity values and observational data in cycle II, it is known that the actions taken in this cycle have succeeded in improving children's simple science. This is proven by the results of experimental activities carried out by children who have met the predetermined level of developmental achievement.

The learning outcomes of each cycle are growing. In the pre-cycle the average value is 47.9. in the first cycle the average value is 67.7, and in the second cycle the average value is 90.6. Likewise, the percentage of children categorized as Very Good Developing in each cycle of learning also increased. In the pre-cycle 0% of children, in the first cycle 3 children (25%), and in the second cycle 9 children (75%) of the total 12 children who participated in simple science activities through the experimental method. Based on Table 4, it is known that children have reached the Developmental Achievement Level (TCP). So it can be

concluded that the experimental method can improve children's simple science skills.

In line with the results of the research conducted, the class teacher when interviewed about whether children understand more when introducing simple science to recognize the properties of water through the experimental method answered that children are very easy to understand after we carry out experimental activities on the nature of falling water, following the shape of the container, absorb, and react to certain substances.

The results of this study are in accordance with the opinion of Nugraha (2005:125) that science process skills for early childhood are aimed at making children recognize and understand the science and concepts that exist in science, such as understanding the environment around children feeling curious or investigating, exploring the environment. around.

Science activities for early childhood are interesting, emphasize processes rather than results, are probing, make children explore their environment, do questions and answers with friends and teachers and let children express what they see and learn but remain under the supervision of the teacher. (Suyanto, 2008:76-80).

4. Conclusion

Based on the results of Classroom Action Research (CAR) and discussions in cycle I and cycle II, it can be concluded that the experimental method can improve the simple science skills of children in BI class in Raudhatul Athfal Bustanul Ulum Muaro Jambi. This can be seen from the increase in children's simple science skills obtained from each cycle. At the time of pre-cycle or before the action was taken, the average score of the children was 47.9 with the number of children categorized as very well developed 0 children (0%) out of 12 total children. After the first cycle of action, the average score of students was 67.7 with the number of children categorized as very well developed 3 children (25%) out of 12 total. Then the development of students increased in the second cycle with an average value of 90.6 with the number of children categorized as very well developed 9 children (75%) of the total 12.

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