

Improving Science Literacy Skills Through the Experimental Method of Playing with Soap Bubbles in Early Childhood

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Abstract

The research is motivated by increasing scientific literacy through experimental methods. Literacy is not only limited to discussing the ability to write and read, but can expand understanding which can improve critical thinking skills, problem solving in a different context, effective communication, potential development, and active in society (Eliza, 2022). Therefore, scientific literacy needs to be introduced from an early age because it is important to train the development of scientific concepts and behavior. This article discusses improving scientific literacy skills through the experimental method of playing with soap bubbles in early childhood. The research method used is the observation method, this research was carried out not only by researchers but also with educators. The aim of this research is to determine the development of scientific literacy in early childhood and also children's enthusiasm for experimenting.

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1. INTRODUCTION

The definition of early childhood put forward by NAEYC (National Association for Education for Young Children) is a group of individuals in the age range 0-8 years. Early childhood is a group of people who are in the process of growth and development. At this age, experts call it the Golden Age, which only occurs once in the development of human life.

Science has a variety of activities, and one of the very important scientific contents as a means of developing early childhood development is science. Conceptually, there are several definitions and boundaries of science put forward by experts, including Martin (2009) who defines science as a process that produces knowledge, therefore two factors must be considered, namely process and product. The science products in question are applications, facts, concepts, theories, laws and attitudes resulting from doing science. There are three aspects of science learning, namely science as knowledge, science as a way of knowledge and science as a process (Nurhafizah, 2017).

Science is the study of nature in relation to the environment and oneself. Children's science processing abilities that have not developed optimally can result in children's difficulties in developing cognitive, affective, psychomotor and critical and creative thinking abilities. Introducing science to children can be done with activities and materials that are close to children's lives. According to Yulianti (2010:26), introducing science to children can be done by observing and investigating phenomena in the surrounding environment. Children can learn science through various objects, for example water, paper, clay, leaves and trees around the school or house.

Scientific literacy is the ability to explain, evaluate, make discoveries and interpret them so that they can be applied in real life. Scientific literacy influences the development of scientific thinking in early childhood (Choiriyah et al., 2021). This ability allows children to think based on logical facts. Problems faced with scientific thinking processes stimulate children to explore possible answers by linking the knowledge they already have. Science is a material that is close to children's lives which allows them to learn about their environment. The sense of sensitivity

and care for the environment will increase when children are familiarized with scientific literacy (Z & Eliza, 2021). Scientific literacy should start from an early age because this literacy concept stimulates the creativity, logic, curiosity, collaboration and critical thinking that students need (Aronin & Floyd, 2013; Marliza & Eliza, 2019). Scientific literacy is defined in PISA as the ability to use scientific information, identify questions, and draw conclusions based on facts to understand the universe and changes caused by human activities (Sutrisna, 2021). So it can be concluded that scientific literacy is a person's effort to understand science and communicate scientific information verbally to generate attitudes and sensitivity towards oneself and the environment around them (Purwasi & Yuliariatiningsih, 2018).

Playing soap bubbles is a fun game and can encourage children's growth and development, especially for scientific learning. Children can benefit cognitively from playing with soap bubbles mixed with various colors by understanding the meaning of color.

Based on the results of observations carried out at the Asy-Syubbanulwathon Kindergarten in Tasikmalaya City, because scientific activities are rarely carried out, children appear enthusiastic when invited to play with soap bubbles, but scientific literacy is rarely done in this kindergarten.

Various skills that can be carried out through playing science are observing, estimating, conducting experiments and communication skills. Therefore, educators are required to be more creative in creating a learning atmosphere by introducing, utilizing and creating materials available in the surrounding environment, of course by paying attention to children's development. Based on the results of observations, several problems were identified related to the lack of scientific literacy in early childhood. This is due to the lack of knowledge in their own environment and children's cognitive abilities are limited, because the abilities they develop only emphasize religion. So this research uses the observation method by experimenting with playing with soap bubbles to improve literacy skills by recognizing colors and children are able to understand the meaning of recognizing colors.

Based on researchers' observations of current technological developments, almost all levels of society use Android in their daily lives, children play online games too often and also often watch videos on YouTube which even in the discussion of the videos do not discuss science. Based on the problems above, the author intends to try to increase scientific literacy through the experimental method of playing with soap bubbles. The aim of this research is to find out whether the experimental method of playing with soap bubbles can increase scientific literacy in young children. Practical benefits for educators can provide input that experimental methods in efforts to increase literacy in children can be applied. The benefits for children/students can increase enthusiasm for learning and increase knowledge related to nature and science.

According to Djamarah (in Putra 2013: 132) the experimental method is a way of presenting lessons when children carry out experiments by experiencing and proving for themselves something they have learned. Meanwhile, according to Sumantri et al (in Putra 2013: 132), the experimental method is defined as a way of teaching and learning that involves children experiencing and proving for themselves the process and results of experiments.

Based on the background of the problem identification described, the problem that can be formulated is as follows:

- a. How to increase scientific literacy through the soap bubble experiment method?
- b. Can playing with soap bubbles improve scientific literacy skills in recognizing colors?

2. RESEARCH METHOD

This research was carried out using the observation method at the Asy-Syubbanulwathon Tasikmalaya Kindergarten on March 2 2024 when they participated in experimental activities. The children's reactions to experiments were very enthusiastic because in this kindergarten they always experiment, but scientific literacy is rarely applied. This research approach is a type of classroom action research. Data sources were obtained from informants, places and events.

The data collection technique used is observation, with the implementation process using participant observation. This research was carried out collaboratively, which means the researcher did not conduct the research alone but collaborated with the class teacher.

Suryanto (Jakni, 2017: 3) also stated that in short, classroom action research can be defined as a form of research that is reflective by carrying out certain actions, to improve and/or increase learning practices in the classroom in a more professional manner.

3. RESEARCH RESULTS AND DISCUSSION

3.1. Research result

Observation results showed that the activity of playing with soap bubbles carried out at Asy-Syubbanulwathon Kindergarten to increase scientific literacy had been carried out and could be stimulated in children. Children can understand various colors and can name color combinations. In introducing colors using food coloring, children looked very enthusiastic in this experiment.

Based on the children's needs questionnaire, it can be concluded that to increase children's scientific literacy, interesting, innovative and interactive experiment-based science game media are needed. Children will be more interested in participating in learning using experimental methods because there is interaction that activates children so that children do not get bored and is in accordance with the needs of the current modern era. With this experiment, it can be seen that children's scientific literacy has increased because they are very enthusiastic about learning.

The problem in this research is conducting interviews with class teachers and conducting class observations. From interviews and observations, the problem was obtained, namely that the majority of children's scientific literacy skills were still lacking.

The next stage is collecting information. Collecting information is very important to find out the needs of teachers and children for the product being developed. The first stage carried out was collecting information by conducting interviews with teachers. The next stage is collecting reference sources, namely journals related to improving scientific literacy skills through the experimental method of playing with bubbles in early childhood. Apart from that, we also collect information through sources relevant to the research.

3.2. Discussion

Playing with soap bubbles to improve children's scientific literacy skills takes the form of recognizing colors and mixing colors not only to enable students to understand the material, but also to be able to explain the meaning of the material which can lead children to the level of application of the material being studied.

The increase in the results of children's scientific literacy abilities is carried out by integrating learning and habituation in everyday life which is able to maximize the development of children's scientific literacy abilities. Children's scientific literacy skills in teaching and learning activities that emphasize processes and active learning so that children can directly solve problems that arise while playing with the knowledge they receive during learning activities.

One of scientific activity for children is playing with soap bubbles. Playing with color bubbles is the best for helping children learn about colors and sharpening their cognitive abilities because it allows teachers to describe different colors by combining them. For example, yellow and red will become orange, this is of course children like it so that children can continue to remember colors when playing with soap bubbles.

Tools and Materials for making soap bubbles:

- a. Aqua glass
- b. Water
- c. Soap
- d. Straw for blowing bubbles
- e. Food coloring

According to Juhji (2016) claims that the scientific method for making soap bubbles is to mix one spoonful of glycerin with two liters of water to make a soap solution. This can train hand, eye and mouth coordination while having fun playing with soap bubbles. Blowing soap bubbles can also activate the mouth muscles, which can facilitate small children's speech due to the movement of the lips and oral cavity.

Steps to Playing with Soap Bubbles

a. Researchers prepared tools and materials in the form of:

- Half a cup of dish soap
- 1.5 glasses of water
- 2 teaspoons of granulated sugar
- Straw

b. Mix the three ingredients in one container then stir gently until evenly mixed

c. Pour the finished soap balloon solution into the bottle and close tightly

The children were very enthusiastic about playing with soap bubbles, they recognized several colors. When the researchers blew balloon bubbles, they didn't forget to ask "what color is this" they enthusiastically answered "RED".

Benefits of Playing with Soap Bubbles for Young Children

- a. Train oral motor skills
- b. Train eye and hand coordination
- c. Practicing his visual tracking skills
- d. Develop children's gross and fine motor skills
- e. Practice social skills
- f. Train children's sense of calm

The Effects of Playing with Soap Bubbles for Early Childhood

Early childhood development can be influenced by science play in the following ways:

a. Social Development

Children have the opportunity to share or exchange materials, tools, ideas and observations with other children through scientific activities, namely soap bubbles. With these science games, children can demonstrate their cooperative skills while engaging in group science play activities.

b. Emotional Development

When children succeed in investigating the knowledge being carried out or in finding solutions. For example, scientific activities in exploring and discovering knowledge have enormous potential in building a sense of pride and mutual respect.

c. Physical Development

Little ones will be able to use and move their big and small muscles through this soap bubble game. For example, when children experiment with adding soap and water to a container and blowing bubbles, they may bounce and chase balloons, perform more complex movements or a combination of these.

d. Cognitive Development

Children can utilize their cognition to solve arithmetic and language difficulties by playing with soap bubbles as a science exercise while they are observing, predicting, researching, testing, expressing quantities, and communicating.

e. Creativity Development

Experiment and investigate children's imagination by playing with soap bubbles using concepts or techniques with direct instruments and sources. For example, combine soap and water in a simple container.

4. CONCLUSION

Scientific literacy is very important for young children to provide a basic overview of science and improve other aspects of development for young children. Apart from implementing scientific literacy, it can develop children's abilities in improving scientific thinking in early

childhood. Apart from that, scientific literacy can also develop the mindset of young children by building the character of responsibility towards themselves and the universe. With the application of scientific literacy in early childhood education, it is hoped that it will be able to build and develop the scientific literacy abilities of PAUD educators so that they can develop scientific literacy in student-oriented learning to understand and apply scientific concepts, use concrete media and be able to provide an understanding of science to young children. early.

Playing with soap bubbles is a science play activity that can be developed in early childhood because playing with soap bubbles is very fun and can also be beneficial for aspects of children's development including social-emotional, physical, cognitive, or critical and creative thinking.

Through the experimental method, educators can increase creativity in learning science in early childhood, by using interesting, innovative and creative teaching aids or pictures with the experimental method it will stimulate children to carry out experiments so that the creativity of early childhood increases. From the experimental results above, the experimental method is an effective learning method for increasing the scientific literacy of early childhood.

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