

Introduction to Science Through Simple Experiment Methods in Group B Of RA Al-Munawir Ahmad Leuburi, Lembata Regency

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ABSTRACT

This study aims to: (1) identify the process of introducing science through simple experimental methods in Group B of RA Al-Munawir Ahmad Leuburi, Lembata Regency; (2) identify the supporting factors for introducing science through simple experimental methods in Group B of RA Al-Munawir Ahmad Leuburi, Lembata Regency; and (3) identify the inhibiting factors in introducing science through simple experimental methods in Group B of RA Al-Munawir Ahmad Leuburi, Lembata Regency. This research employs a descriptive qualitative method. The research approach uses descriptive-analytic techniques. The data sources consist of three participants: the principal, the Group B classroom teacher, and seven Group B students selected randomly. Data collection techniques include observation, interviews, and documentation. Meanwhile, data processing and analysis were conducted through data reduction, data presentation, and conclusion drawing or verification. Data validity was tested using triangulation methods, specifically technique triangulation and source triangulation. The results show that the process of introducing science through simple experimental methods is highly important, as children at this age are in the cognitive development stage. This method helps stimulate children's critical, logical, and creative thinking skills through direct experiences. Additionally, this approach naturally and enjoyably introduces the foundations of scientific thinking. The process of introducing science through simple experiments consists of four stages: explanation, preparation of tools and materials, application, and evaluation, as implemented in Group B of RA Al-Munawir Ahmad Leuburi, Lembata Regency. The supporting factors in the science learning process using simple experimental methods include high student concentration and the use of active and collaborative learning approaches. The obstacles faced by teachers during the implementation of simple experimental activities include limited learning media or tools, lack of teacher creativity, and insufficient parental support. The implementation of this research has three implications: for the institution, it contributes to curriculum development; for teachers, it enhances teaching skills; and for future researchers, it encourages the development of more intensive approaches.

Keywords: *Simple Experiment Method, Science Introduction.*

1) INTRODUCTION

Education is the key to the success of Indonesia's development, both now and in the future. Through education, it is expected that every individual will attain a higher level of empowerment and the ability to participate in the development process. In the midst of rapid global advancements in this

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digital era particularly in the fields of technology and science national education must continue to evolve in order to adapt to the progress of the times.

The paradigm used to measure a country's progress has changed. Previously, it depended on the abundance of natural resources (NR), but now it relies on the strength of human resources (HR). Education is a fundamental planning effort aimed at creating a learning environment and learning process in which students actively develop their potential to acquire spiritual and religious strength, self-control, personality, intelligence, morals, life skills, and general knowledge, as mandated by law.

One of the functions of education for a nation is to achieve the country's own goals. The state, as the highest social institution, pursues the highest aim: human well-being. Education serves as a provision for engaging in respectable activities or occupations. Therefore, education must be guided by legal regulations so that it aligns with the results of psychological analysis and follows gradual developmental progress, both physically and mentally.

It has become a shared understanding that education is a means used by humanity throughout history to transmit and transform values as well as knowledge. Because of its strategic role in the transmission and transformation of values and knowledge, the realm of education is essential in instilling and developing national character. Education should not merely teach moral knowledge but also cultivate love for moral values and willingness to act morally.

Education should begin from early childhood so that children can engage in enjoyable and meaningful activities that help them develop positive social interactions. Early childhood refers to children from birth to six years old, including those still in the womb. During this developmental stage, children experience significant social, emotional, and cognitive growth. Early childhood education is carried out through the provision of educational stimulation to support the physical and spiritual growth and development of children so that they are ready to enter primary education. One form of educational provision is early childhood education, which focuses on laying the foundation for physical growth and development, intelligence, social and emotional skills, language, and communication in accordance with the characteristics and developmental stages of young children.

Science is knowledge more precisely, knowledge that discusses nature and the physical world. The term science comes from the Latin word *scientia*, meaning knowledge or deep and accurate understanding. Science introduction is a form of learning that is oriented toward and related to natural events within the surrounding environment. Introducing science is essential for early childhood.

Science introduction is a form of learning that is oriented toward and related to natural events within the environment. Science is important to introduce at an early age. Introducing science to children plays an important role in laying the foundation for abilities and for shaping the expected quality of human resources. Education must always be directed toward improving the quality of human resources, especially in early childhood. Children must be prepared to become resilient, independent, and creative individuals in facing an era of globalization filled with competition. However, the implementation of learning often does not support this ideal. Science introduction is frequently delivered only through lecturing, without using methods that emphasize process.

Science learning for early childhood should focus more on the process rather than the results. The science process is also known as the scientific method, which generally includes: observation, identifying problems, conducting experiments, analyzing data, and drawing conclusions. Science activities can facilitate children in exploring various objects around them, whether living or non-living.

From an early age, children must be introduced to science through enjoyable activities and habits that allow them to experience scientific processes directly. One example is creating color layers in a bottle. This will ensure that children not only understand the results but also the processes involved in the science activities they carry out. Science enables children to explore various objects, both living and non-living. It also trains them to use their senses to recognize different characteristics of objects and events.

Conceptually, there are several definitions and boundaries of science. Science is a field of natural studies with a scope involving matter and energy, found in both living and non-living things, and it largely discusses the natural world, such as Physics, Chemistry, and Biology.

The experimental method, on the other hand, is a method that provides opportunities for children, either individually or in groups, to engage in processes or experiments. The experiments referred to here are not complex procedures that children must master as a way to understand certain concepts or basic principles of experimentation, but rather activities that allow them to understand how a process occurs, why something happens, and how they can find solutions to existing problems ultimately enabling them to create something meaningful from these activities.

Previous studies similar to this research include: a study titled *Introducing Science Through Simple Experiments for Group B Children at KB-RA IT Al Husna Yogyakarta*; *Science Learning Through the Experimental Method for Optimizing Early Childhood Creativity at TK Pertiwi*

Bojongsari, Kembaran District, Banyumas Regency; and The Application of the Experimental Method in Science Learning for Early Childhood at PAUD Tunas Harapan.

Science learning in schools that does not apply the experimental method tends to be less effective because students do not directly experience the process of discovering knowledge through experimentation. Without experiments, science learning is limited to theories and abstract concepts that are difficult to understand in depth. The experimental method allows students to observe, analyze, and evaluate experimental results in practical ways, enabling the development of critical thinking, creativity, and problem-solving skills that are essential for comprehending science holistically. Without direct experiences, science learning becomes less engaging and fails to connect scientific concepts with everyday life.

Science learning using experimental methods provides additional value for children because it allows them to directly interact with processes or experiments. Based on the researcher's initial interview on January 17, 2024, at RA Al-Munawir Ahmad Leuburi, Lembata-NTT, daily student activities follow typical teaching and learning routines, including science learning. However, science activities were not carried out continuously and were conducted only once per semester—and even that has become ineffective since early 2023. Continuous use of worksheets (LKA) made students feel bored and fatigued. This prompted the researcher to conduct a study at RA Al-Munawir Ahmad Leuburi, Lembata-NTT by applying experimental learning to prevent students from feeling bored during lessons and to train them to solve problems independently, thereby fostering a sense of autonomy.

The emergence of various problems in Class B at RA Al-Munawir, in particular, became the focal point of the researcher's attention. Based on this, the researcher became interested in studying the process of science introduction through the experimental method in Group B at RA Al-Munawir Ahmad. The researcher's interest is also based on the assumption that the learning process at the RA runs well, even though the institution is located in a remote rural area far from urban centers.

Initial observations across several early childhood education institutions (PAUD) in Buyasuri District, Lembata, revealed that the application of science learning through experimental methods is still rare; some institutions have implemented it, but only infrequently. Therefore, the researcher developed this background to understand in detail how science learning through experimental methods is implemented at RA Al-Munawir Ahmad Leuburi, Lembata.

2) METHODS

This study used descriptive qualitative research. The term descriptive comes from the English word to describe, which means to present or illustrate something, such as a state, condition, situation, event, activity, and so on. This type of research produces findings that are not derived through statistical procedures or numerical calculations. Phenomenology is an approach that involves observing real situations in the field, observing students, and refraining from active involvement in the research process. The location of this research is RA Al-Munawir Ahmad in Leuburi Village, Buyasuri District, Lembata Regency.

The data sources in this study consist of primary and secondary data. Primary data were obtained directly from the informants, namely the principal, the Group B teacher, and seven students. Secondary data were collected from supporting media, such as books, articles, the internet, or scientific journals relevant to the research subject. Data were collected through observation, interviews, and documentation, using observation instruments and interview guidelines for the informants. This study employed three interactive stages of data processing and analysis: data reduction, data display, and conclusion drawing. In addition, technique triangulation and source triangulation were applied to ensure data validity.

3) RESULTS AND DISCUSSION

The Process of Introducing Science Through Simple Experimental Methods in Group B of RA Al-Munawir Ahmad Leuburi, Lembata

The process of science learning is a process in which children study nature and its contents through scientific methods to equip them with cognitive development skills. To enhance children's cognitive abilities, teachers encourage students to engage in various learning stimulations or activities designed to stimulate their cognitive growth. Based on the observations conducted during the teacher's implementation of simple experimental activities to improve cognitive abilities in Group B students.

In the process of introducing science through simple experimental methods in Group B, there are four stages: explanation, preparation of tools and materials, the experimental process, and

evaluation. The learning process consists of three main phases: the opening activity, the core activity, and the closing activity.

a. Opening

Ms. Rahmatia welcomed the children as they arrived, shaking hands and responding to their greetings. The students hurried into the classroom and placed their bags in the designated area. Ms. Rahmatia then invited the children to form a circle. She began by greeting them enthusiastically, saying, “Good morning, smart children,” to which the students responded cheerfully, “Good morning, Teacher.” She then took attendance through a song, followed by inviting the children to recite a prayer before learning, beginning with the instruction “prayer position,” continuing with daily prayers and short surahs. This activity continued until 08:30, before moving on to the core activity.

b. Core

At 08:30, the students sat in their respective places. Ms. Rahmatia asked them about the day, date, month, and year. She then introduced the day’s theme and subtheme. The lesson began with a conversation about the theme “Nature” and the subtheme “Natural Phenomena.” The teacher explained that they would be conducting a simple experiment. She introduced the colors of the rainbow and then explained the materials to be used in the experiment, which included mineral water, food coloring, a clear bottle, cooking oil, dish soap (Sunlight), and a spoon. Before beginning the experiment, the teacher explained the colors, shapes, method, and amount of water to be used.

After giving the explanation, Ms. Rahmatia distributed the tools and materials to the students. Because the supply was limited, the children were divided into groups. Next, she distributed the materials and provided instructions for conducting the simple experiment. The activity began by mixing food coloring with water and stirring it. Then, the students poured dish soap into an empty clear bottle, followed by adding the colored water as the second layer, and then the last step was adding cooking oil. However, when pouring the food coloring and the cooking oil, three students were in a hurry, causing the layers that form the rainbow to be imperfect. The activity ended at 09.30 AM.

c. Closing

At 10.00 AM, the class entered the closing activity. Ms. Rahmatia instructed the children to enter the classroom and form a circle. The activity continued with a “competition of sitting neatly and quietly.” After that, the students were allowed to drink. Before going home, the teacher conducted an

evaluation through a question-and-answer session about the activity they had done and the students' impressions during the simple experiment. Then, the teacher led the students to recite the prayer for riding a vehicle, the closing prayer, and the prayer for safety in this world and the hereafter together.

After praying, the teacher gave the signal to go home by saying, "Good afternoon, students," and the students responded together. The teacher then greeted, "*Assalamu'alaikum wr. wb.*," and the students replied in unison, "*Wa'alaikumussalam wr. wb.*" The students shook hands with the teacher and left the classroom while carrying their bags neatly. This activity ended at 10.40 AM. The researcher also conducted interviews with the principal, the classroom teacher, and the students regarding the types of activities carried out at RA Al-Munawir Ahmad to improve students' cognitive abilities. The following is the result of the interview with Mrs. Sumina, S.Ip., the principal of RA Al-Munawir Ahmad, who stated:

"Children's cognitive abilities can be improved in various ways. The science introduction that we apply at school consists of two types: natural science and artificial (man-made) science. For natural science, students are taken directly into nature to gain firsthand experiences so they can interact with the real world. The concept we use in science learning is that children are asked to observe and then convey the results of their observations. Meanwhile, artificial science consists of classroom activities such as making soap bubbles and experimenting with sinking or floating objects."

Based on the interview findings conducted with the Group B classroom teacher, it was discovered that:

"The process of introducing science through simple experimental methods is that the teacher needs to plan, arrange the steps of the experiment, prepare the tools and materials (clear bottle, water, cooking oil, red food coloring, spoon, dish soap, and a glass), conduct a trial beforehand to ensure safety during the experiment, then provide clear instructions and guide students throughout the learning process. The teacher then introduces the tools and materials used for the simple experiment: first, fill about $\frac{1}{4}$ of the empty glass with water and add food coloring, then stir with a spoon; pour sufficient dish soap into the bottle; then slowly pour the colored water into the bottle; next, pour enough cooking oil; observe the colorful layers resembling a rainbow. After that, the teacher gives instructions to the students so they can perform the simple experiment."

Based on observations conducted during the teacher's efforts to strengthen students' cognitive abilities, as well as interviews conducted in the field, the researcher observed that in the process of the activity, the teacher applied various strategies and methods to stimulate and improve the students' cognitive development. The teacher demonstrated creativity by conducting simple experiments and tried to attract the interest of Group B students.

The following are the types of activities carried out during the simple experiment in Group B:

a. Explanation

In this activity, the teacher explains to the students the sequence of the simple experiment process, starting from: giving explanations, preparing tools and materials, explaining in detail the process of the experiment, allowing the students to conduct the experiment, and evaluating as well as gathering students' impressions.

b. Preparing tools and materials

In this activity, the teacher prepares and introduces the tools and materials needed for science learning through simple experiments using the provided items, such as mineral water, dish soap, red food coloring, cooking oil, spoon, and a clear bottle.

c. Application

In stimulating students' cognitive development, the teacher plays a role in designing and providing varied experimental activities so that the students enjoy the activity and feel happy participating in it.

d. Evaluation

In this activity, the teacher re-evaluates the learning that has been carried out, such as asking again about the tools and materials used in the simple experiment.

The four stages of the science introduction process through simple experiments above align with the theory developed by David Kolb, who states that learning occurs through a cycle consisting of four interrelated stages. Kolb explains that learning happens when individuals engage in direct experience, reflect on that experience to form ideas, and finally test those ideas in new situations. The four main stages in Kolb's Experiential Learning Theory are reflection (explanation), concrete experience (tools and materials), application, and evaluation.

Meanwhile, according to Ariana, the syntax or steps of learning can include: basic statements, planning design, creating schedules, testing results, and evaluation.

Based on interviews, observations, and documentation from the seven students observed, the achieved indicators showed that the ability to recognize science through simple experiments developed very well in four students and developed as expected in three students.

The supporting factors of science introduction through simple experimental methods are as follows:

a. High student concentration

The enthusiasm of the students in science learning can be seen when the teacher arrived at school bringing tools and materials from home, causing many students to approach and ask questions.

b. Active and collaborative learning approach

This learning method involves students directly and actively in the process and encourages cooperation and interaction among students.

These observations are supported by Jean Piaget's theory, which states that children become focused and highly active when learning aligns with their stage of cognitive development. Challenging but appropriate methods will increase engagement and concentration.

It is also explained by Muhammad Ilham in Nur Ida's research that the level of students' concentration significantly influences their learning outcomes. Students with high concentration tend to achieve better learning results.

Based on these statements, it can be concluded that in the world of education—especially for educators it is important to understand what students need, create enjoyable and meaningful learning experiences, and develop new innovations in learning.

However, every learning process has obstacles. Likewise, during the simple experiment activity in Group B at RA Al-Munawir Ahmad, several challenges were encountered:

- a. Limited learning media or teaching tools
- b. Lack of teacher creativity
- c. Lack of parental support

From the perspective of constructivism, meaningful learning occurs when students can connect new knowledge with direct experience through interaction with the environment and learning media.

However, the lack of learning media becomes a significant obstacle in creating concrete and contextual learning experiences. According to this theory, learning media function as a bridge between abstract concepts and students' real understanding. Without adequate media, students tend to struggle to build deep understanding because learning becomes too theoretical and does not optimally involve the senses.

This is in line with Vygotsky's view that effective learning occurs when there is support from the environment, including learning tools as part of scaffolding that helps students reach their zone of proximal development.

Slameto also explains that factors that hinder children's creativity include parenting patterns. Parents who are too busy and limit children's activities will hinder children from expressing ideas and thoughts. Children will engage in activities that develop creativity if they receive encouragement from their parents.

These three inhibiting factors align with the opinion of Hamalik, who states that the success of a learning process is greatly determined by the teacher's creativity and ability to design and implement appropriate learning methods. Hamalik also emphasizes that learning media are important components that support the learning process. If media or tools are difficult to access, learning activities become less interesting and less interactive.

4) CONCLUSIONS

Based on the results of the research in Group B at RA Al-Munawir Ahmad, the following conclusions can be drawn:

The process of introducing science through simple experimental methods in Group B at RA Al-Munawir Ahmad Leuburi, Lembata Regency consists of four stages. The first is Explanation. In this stage, the teacher explains the sequence of the simple experiment process from beginning to end. The next stage is preparing tools and materials, where the teacher introduces everything needed for the science activity and prepares the materials such as water, cups, bottles, red food coloring, oil, dish soap, and spoons. Then comes application, where the students begin conducting the simple experiment, followed by evaluation.

The supporting factors in introducing science through simple experimental methods in Group B at RA Al-Munawir Ahmad Leuburi, Lembata Regency are the high concentration of the students, which indicates that they are interested in the learning activity. In addition, an active and collaborative learning approach encourages students to participate directly and actively in the learning process, as well as promotes cooperation and interaction among them.

The inhibiting factors in introducing science through simple experimental methods in Group B at RA Al-Munawir Ahmad Leuburi, Lembata Regency include the limited availability of media or learning aids. This affects the effectiveness of the learning process and the students' understanding. There is also a lack of creativity from the educators, which becomes the main reason students become bored quickly, as the learning methods are less engaging. Furthermore, the lack of parental support also hinders the development of children's skills and understanding in science.

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