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The Implementation of Early Childhood Learning Methods Through the Floating Corn Science Experiment

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ABSTRACT

Overall, the implementation of early childhood learning methods through floating corn experiments is very important because it can improve the science, cognitive, and social skills of early childhood. From this experimental method, it helps early childhood develop simple science skills such as recognizing corn, thinking critically, and developing cognition. From this floating corn experiment, it can also increase environmental awareness around them, such as how corn can be a useful natural resource. The method used involves hands-on experimental activities where children observe the floating behavior of corn in water, encouraging direct exploration and discussion. Thus, the implementation of early childhood learning through this experiment aims to help early childhood experience interactive, hands-on, and interesting learning experiences which can help them develop the competencies and skills needed to face challenges in the world of school and the future. In this experiment, there are several things that must be considered, namely: children's abilities and the completeness of the experimental materials.

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1. INTRODUCTION

The experimental method is a research approach designed to investigate cause-and-effect relationships between certain variables (Siroj, *et al.*, 2024). In this method, researchers control independent variables to observe their effects on dependent variables, with the aim of drawing causal conclusions. Experiments are often conducted under controlled conditions, where researchers can manipulate one or more independent variables to see their impact on the dependent variable (Sari, *et al.* 2021). The experimental process involves several steps, including research design, data collection, statistical analysis, and drawing conclusions. Good experimental design includes selecting a control group to compare with the experimental group, using randomization to reduce bias, and controlling for extraneous variables that can affect the results of the study.

During the experiment, data is systematically collected and can be measured quantitatively or qualitatively. Statistical analysis is then used to determine whether the observed differences between the experimental and control groups are statistically significant or just a matter of chance. The conclusions drawn from the experiment help identify patterns of cause-and-effect relationships between the variables studied, which in turn can be used to understand the phenomenon being studied.

The selection of learning methods is a strategic process in designing effective learning experiences (Djalal, 2017). The learning method chosen must be in accordance with the learning objectives, characteristics of the students, and the context and material being taught (Junita *et al.*, 2023). One of the commonly used methods is the expository approach, where the teacher provides information directly to students. This method is suitable for conveying basic concepts and facts (Darmawani, 2018).

In addition, the discussion method is also often used to increase student participation and develop critical thinking skills (Ngadha *et al.*, 2023). Through discussion, students can share ideas, question concepts, and build shared understanding. The choice of method can also be influenced by technology, with technology-based learning approaches becoming increasingly popular, such as the use of online platforms, simulations, or educational games (Maulid, 2024).

The creative and interactive aspects can also be strengthened through the project method, where students are involved in activities that require problem solving and collaboration (Ediana *et al.*, 2023). This method can improve practical skills and prepare students to face real-world situations. In addition, it is also important to consider students' learning styles, such as visual, auditory, or kinesthetic, when choosing a learning method (Azizah *et al.*, 2023). By understanding students' learning preferences, teachers can create more effective and interesting learning experiences (Purmawanto, 2023). Overall, choosing the right learning method plays an important role in creating a learning environment that supports the holistic development of students (Khaeriyah *et al.*, 2018).

Providing science learning from an early age provides a number of significant benefits in children's development (Rahim, 2023). Science learning at an early stage of a child's life can train various aspects of their cognitive, social, and motor skills.

First, early childhood science learning helps stimulate curiosity and exploration. Children are naturally curious about the world around them, and science learning provides a platform to satisfy that curiosity. Through simple experiments, observations, and questions, children can understand the basic principles of science (Anggraeni, 2024).

Second, science learning can develop critical thinking and reasoning skills. Children are encouraged to understand cause-and-effect relationships, observe patterns, and identify

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differences. This helps them develop logical and analytical thinking skills that are essential for the problem-solving process.

Third, early childhood science learning also supports the development of fine and gross motor skills. Activities such as observing, trying on their own, or making small experiments involve hand movements, eye-hand coordination, and general body coordination.

In addition, early childhood science learning can strengthen children's social skills (Ratnaningsih *et al.*, 2025). When they are invited to work together in groups, share ideas, or explore together, children learn about cooperation, communication, and respect for the views of others.

Thus, providing science learning from an early age not only provides a foundation of scientific knowledge, but also forms the basis for children's holistic development, including cognitive, social, and motor aspects (Rohmah *et al.*, 2023). This creates a strong foundation for further learning and development of children's abilities in various fields (Nurfuady *et al.*, 2019).

2. METHODS

This qualitative research was carried out at RA Azrina which is located on Jl. Marelan Raya No. 287b, next to Irian. The research took place for one day, exactly on Wednesday, October 27 2023. The research subjects were children aged 4-6 years who were members of the Arrahman/Aarrahim group at RA Azrina with a total of 46 students.

This research method will use a qualitative approach to understand in depth the experiences and perspectives of children in the learning context at RA Azrina. This approach allows researchers to explore children's meanings, perceptions, and interactions with their learning environments.

The initial step of this research involved participatory observation during learning activities at RA Azrina on a predetermined day. Researchers will systematically record children's activities, interactions and responses during the learning process. In addition, informal interviews with RA Azrina teachers and staff will also be conducted to gain further understanding of the learning context. After that, structured interviews were conducted with a number of children aged 4-6 years to obtain their views on learning activities, classroom atmosphere, and interactions with peers. This technique allows researchers to gain deeper insight into children's perceptions of the learning process.

The collected data will be analyzed thematically to identify patterns, themes, and meanings that emerge from children's experiences at RA Azrina. The results of the study are expected to contribute to our understanding of the quality of learning at the RA level and provide insights that can improve children's learning experiences in this context.

3. RESULTS AND DISCUSSION

Based on the results of observations conducted on Wednesday, October 27, 2023, research on science learning with the theme "Floating Corn" at RA Azrina involving 46 students showed several important findings. These observations indicate that the initial conditions for the development of science learning at RA Azrina still face several challenges.

From the results of the observations, it can be concluded that children's ability to understand science learning is still relatively inconsistent. Some children seem to respond less well to the learning material. However, there are a number of children who show high enthusiasm and enjoy being involved in science learning, especially on the topic of "Floating Corn".

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The children who showed interest seemed to enjoy the experimental elements and the mixing of materials. They appeared active and excited when given the opportunity to mix various materials and see the resulting reactions. This suggests that the experimental approach can be an effective way to increase children's interest in science learning. However, some children also seemed to have difficulty understanding the concept of the "Floating Corn" experiment. Some children did not fully understand the names of the materials being mixed and the reactions that occurred when the materials came into contact. The main reason for this lack of understanding may be due to the children's lack of prior knowledge regarding certain materials and the science concepts being introduced.

Thus, the results of this observation provide an overview that science learning at RA Azrina needs to be improved, especially in terms of conveying concepts and the necessary initial knowledge. Increasing interactivity and a more comprehensive learning approach can help overcome the obstacles in children's understanding of the science material.

During the "Floating Corn" experimental learning, teachers played a crucial role in preparing and presenting learning materials to students at RA Azrina. Teachers, including one who conducted the initial experiment, played an active role in explaining the concept and preparing the tools and materials needed for the learning. Before starting the experiment, the teacher first provides an explanation to the students about the learning theme, namely "Floating Corn". In this explanation, the teacher provides information about the materials that will be used in the experiment, ensuring that the materials are in accordance with the learning theme. For example, the teacher will mix materials that are relevant to the theme of corn and floating.

Next, the teacher divides students into several groups, facilitating collaboration between students. At this stage, the teacher provides an introduction to the tools and materials that will be used in the experiment. This introduction aims to ensure that students understand the equipment used in the experiment and introduce them to the materials that will be used. The teacher also provides directions regarding the steps of the experiment to be carried out. Explanations of these steps help students understand the experimental process in more detail, from mixing the ingredients to observing the results. The teacher provides clear guidance to ensure that students can follow the experiment well. With the involvement of the teacher in the preparation and presentation stages of the material, it is hoped that students can better understand the concept of "Floating Corn" and enjoy learning science through this experiment. Overall, the role of the teacher in supporting the experimental learning process is important to achieve optimal understanding and interest from students.

After the teacher provides an in-depth explanation and examples related to the "Floating Corn" experimental activity, the next step is to provide opportunities for children to be directly involved in experimental activities at RA Azrina. The teacher ensures that each step of the experiment is explained in detail so that children can understand the process as a whole.

Children are given the responsibility to carry out the experimental steps, starting from pouring water into a container, adding vinegar, stidaci, and baking soda, to putting corn into a container that has been filled with the mixture of liquids. The combination of baking soda and stidaci in the container creates a chemical reaction that causes the overflow of water and soda. At this stage, children can directly observe the changes that occur in the container, such as the overflow of water and soda which causes the corn that initially sank to float, as shown in the picture. This experimental process allows children to experience practically how the combination of materials can change the properties of an object, in this case, corn.

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Through this activity, it is hoped that children can understand basic science concepts, such as physical and chemical changes, as well as the concept of buoyancy. Apart from that, this direct experience can also increase children's interest and motivation in learning science. This learning process that actively involves students' hands and senses is an effective approach for increasing understanding of science concepts at the pre-school level (Hikam and Nursari, 2020).

Figure 1. Floating Corn

From the observation results above, the researcher can conclude that the powder and powder mixing activity at RA Azrina has the main objective of developing several aspects of child development, especially cognitive and motor aspects. Through this activity, children are invited to actively participate in the learning process, which in turn contributes to their development.

First, in terms of cognitive aspects, the powder and powder mixing activity provides opportunities for children to solve problems. They are given the task of mixing various types of powder, creating certain reactions or changes, and observing the results. This process stimulates children's ability to think logically, identify patterns, and understand basic science concepts. Children learn how materials interact and produce certain effects, actively developing their cognitive skills.

In addition, in terms of motoric aspects, this activity involves children's physical actions in mixing powders and powders. Children learn to use their hands more skillfully, honing their fine motor skills. Mixing materials into new works also involves eye-hand coordination, thus helping to improve their motor control.

Powder and powder mixing activities at RA Azrina also have a further goal, namely to teach children about the process of creation and enrich their learning experience. By actively participating in this activity, children not only gain conceptual understanding, but also develop practical skills that can be applied in everyday situations.

Thus, this activity not only provides a fun learning experience for children but also supports their holistic development, both in terms of cognitive and motor skills. This conclusion emphasizes the importance of an experiential and participatory learning approach in shaping children's development at the pre-school level.

The objectives of science learning for early childhood are very important to build a foundation of knowledge and skills that will help their development (Suhayati and Watini, 2024). Some of the objectives of science learning for early childhood include:

I. Increasing Curiosity: The main objective of science learning for early childhood is to stimulate and maintain their curiosity about the world around them. Through simple experimental activities and observations, children can begin to ask and find answers to their own questions.

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II. Developing Observation Skills: Science learning helps children develop their observation skills of natural phenomena, objects, and events around them. They learn to see, hear, and feel more carefully.
III. Encourage Active Involvement: Young children learn through their own hands. Science learning is designed to encourage active involvement, such as touching, feeling, smelling, and tasting certain objects and materials.
IV. Understanding Basic Science Concepts: Through simple experiments, children can begin to understand basic science concepts such as change, patterns, and properties of objects. This goal forms the basis of their understanding of the principles of science.
V. Developing Critical Thinking Skills: Science learning helps children develop critical and analytical thinking skills. They are encouraged to formulate questions, make predictions, and find solutions through experiments.
VI. Sharpening Language and Communication Skills: Science learning also helps children develop language and communication skills. They learn to convey their observations and ideas, and share information with peers and teachers.
VII. Building a Positive Attitude towards Science: Science learning at an early age aims to form a positive attitude towards science. Children are encouraged to realize that science is something interesting, fun, and relevant to their daily lives (Saleh, 2021).

The importance of including science learning from an early age has objectives that are in accordance with the principles of the nature of science, such as curiosity, process, product, and attitude, for early childhood. The objectives of science learning in early childhood can be described as follows:

I. Curiosity: Arousing and developing children's curiosity about the surrounding environment.
II. Process: Involving children in simple experimental activities to practice logical thinking skills and cause-effect connections.
III. Product: Encouraging children to produce something as a result of their exploration and experimentation.
IV. Attitude: Developing a positive attitude towards science, including continued interest and passion.

The importance of introducing science early on is based on the understanding that early childhood is a critical period in cognitive, social, and emotional development (Kadir *et al.*, 2024). The introduction of science at this stage provides positive stimulation and stimulates children's development. Science learning is directed at training children to do simple experiments, which help them understand basic scientific concepts, stimulate curiosity, and develop logical thinking skills. Science is also considered a science that involves concepts resulting from observations and research on the surrounding environment.

Skills in the science process such as measurement and research can develop aspects of children's cognitive development. This allows children to solve problems, develop skills, and increase interest in science learning (Kurnia, 2021).

The importance of understanding the scope of early childhood science learning includes products, attitudes, and processes of science. Principles such as concrete, introductory, balance between physical and psychological activities, and attention to child development, need to be considered in the implementation of science learning (Ayu and Wayan, 2021).

In addition, science learning that is directly carried out by children provides enthusiasm and motivation, ensures that children are actively involved in the learning process, and strengthens interest in learning science which is beneficial for their development.

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Science learning is directed at developing children's skills through simple experimental activities (Indarwati, 2018). In this context, children are invited to be directly involved in science experiments that involve observation and interaction with certain materials. Through these experiments, the main goal is to help them understand the basic concepts of science in a practical way. Children learn how various elements can interact, observe the changes that occur, and identify the causes and effects of the experiment. In addition, this activity is also designed to stimulate their curiosity about the phenomena around them. Through this direct experience, children are expected to develop an exploratory attitude towards the world around them. Furthermore, science learning also focuses on developing children's logical thinking skills. They are invited to formulate hypotheses, make predictions, and conclude the results of the experiments they conduct. Thus, science learning not only provides conceptual knowledge but also involves children in an active process that builds cognitive skills and stimulates curiosity which is important in their development (Nurlaela, 2023).

4. CONCLUSION

Introducing science learning from an early age is crucial to support early childhood development in ways that align with the nature of science. Observations indicate that science activities significantly contribute to children's cognitive, motor, and attitudinal growth. The primary goals of early science education are to stimulate curiosity, enhance logical thinking, and foster a positive attitude towards science. By engaging in simple experiments, children actively participate in the learning process, observe changes, and practically grasp basic scientific concepts, all while developing motor and cognitive skills. Early exposure to science is particularly important because early childhood is a critical period for cognitive, social, and emotional growth. Science education during this stage provides essential stimulation, building a strong knowledge foundation that benefits children's everyday lives. Overall, an experience-based and participatory approach to science learning plays a vital role in shaping holistic early childhood development.

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