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THE EXPLORATION OF EARLY CHILDHOOD SCIENCE THROUGH DAILY EQUIPMENT: A STUDY AT NURUL HUDA YAPIS KINDERGARTEN, KEEROM REGENCY

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Abstract

This article aims to explain the use of everyday life supplies to teach science related to volume, floating, sinking and solution materials in order to improve understanding of scientific concepts, active participation, and practical skills of early childhood. This article emphasizes a qualitative approach, in data collection and analysis, by directly observing learning activities and conducting in-depth interviews with teachers of Nurul Huda Yapis Kindergarten, Keerom Regency whose data are then juxtaposed with existing literature to enrich the analysis. This article found 3 things: First, the use of daily living supplies in science practicum provides opportunities for children to experience more concrete and interactive learning. Secondly, the use of living supplies in science learning activities can increase children's engagement to develop important practical skills. Thirdly, the equipment used is easy to find and safe, so learning activities can be conducted with minimal risk. Overall, the use of everyday living supplies in science learning at Nurul Huda Yapis Kindergarten not only enriches academic understanding but also supports children's holistic development, preparing them for more in-depth learning in the future.

Abstrak

Artikel ini bertujuan menjelaskan penggunaan perlengkapan hidup sehari-hari untuk mengajarkan sains yang berkaitan dengan materi volume, terapung, tenggelam dan larutan guna meningkatkan pemahaman tentang konsep ilmiah, partisipasi aktif, dan keterampilan praktis anak-anak usia dini. Artikel ini mengedepankan pendekatan kualitatif, dalam pengumpulan dan analisis data, dengan melihat langsung aktifitas pembelajaran serta melakukan wawancara secara mendalam dengan para guru TK Nurul Huda Yapis Kabupaten Keerom yang datanya kemudian disandingkan dengan literatur-literatur yang ada untuk memperkaya analisis. Artikel ini menemukan 3 hal: Pertama, penggunaan perlengkapan hidup sehari-hari didalam praktikum sains memberi kesempatan kepada anak-anak untuk mengalami pembelajaran yang lebih konkret dan interaktif. Kedua, penggunaan perlengkapan hidup dalam kegiatan belajar sains mampu meningkatkan keterlibatan anak-anak untuk mengembangkan keterampilan praktis yang penting. Ketiga, perlengkapan hidup sehari-hari yang digunakan mudah ditemukan dan aman, sehingga kegiatan pembelajaran dapat dilakukan dengan risiko minimal. Secara keseluruhan, penggunaan perlengkapan hidup sehari-hari dalam pembelajaran sains di TK Nurul Huda Yapis tidak hanya memperkaya pemahaman akademis tetapi juga mendukung perkembangan holistik anak-anak, mempersiapkan mereka untuk pembelajaran yang lebih mendalam di masa depan.

Kata Kunci : **Perlengkapan Hidup**, **Sains**, **Anak Usia Dini**, **Keerom**

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Introduction

Science, as a branch of knowledge that explains natural phenomena and the world around us, holds significant importance in the growth and development of education across all levels. The teaching and learning of science often require tools and devices to conduct experiments and observations. However, especially in early childhood education, understanding science does not always necessitate expensive or complex tools. Instead, the everyday environment and materials, such as those used in play or routine activities, can serve as effective mediums for teaching science. Research conducted by Andarie (2023) in Surabaya demonstrates that children more readily comprehend scientific concepts when teaching approaches are aligned with their stages of cognitive development. Supporting this notion, Hayati et al. (2017) observed a significant increase in early childhood scientific knowledge in Sleman District due to teachers stimulating learning processes tailored to students' needs and abilities, identified through assessments conducted at the beginning of the semester.

This evidence highlights the potential of science, as part of an educational curriculum, to enhance early childhood learning outcomes when implemented with interactive and developmentally appropriate approaches. Literature exploring science education can be grouped into three primary perspectives. First, science is seen as a foundational knowledge base. For instance, Rahmi (2023) examined the structure of science as a conceptual framework for introducing the scientific method to elementary school children, finding that systematic and logical thinking can be fostered through this approach. Rosandi Lubis and Salminawati (2022) corroborated this by illustrating those hands-on activities, both individually and in groups, enhance children's understanding of science. Second, science is understood as an essential literacy skill required to comprehend environmental issues and societal challenges. Utami and Desstya (2021) emphasized this through their research, identifying varying levels of scientific literacy among students, with aspects such as "science as a way of investigating" and "science as an interaction between technology and society" showing relatively low scores. This variability underscores the need for targeted approaches to improve scientific literacy. Third, science provides practical benefits to human life. Wijaya and Dewi (2021) highlighted the effectiveness of the Children Learning in Science model, which encourages direct interaction with concrete scientific phenomena in a playful and engaging manner. Similarly, Hanik Mutma'inah et al. (2023) argued that enjoyable and interactive science strategies help instill basic concepts in children. This article builds on these perspectives by presenting a practical science learning model for early childhood education, emphasizing the use of everyday materials to facilitate scientific understanding in a simple yet effective manner.

This study aims to explain a science learning model implemented by Nurul Huda Yapis Kindergarten in Keerom Regency. The model integrates children's daily life experiences and their immediate surroundings as central teaching media, particularly for enhancing cognitive and psychomotor abilities. To achieve this, the article addresses three main objectives: (1) identifying the types of materials used as teaching aids at Nurul Huda Yapis Kindergarten, (2) examining the rationale behind selecting these materials, and (3) analyzing the implications of using such life-based learning tools.

This article argues that using children's experiences and familiar surroundings as teaching media at Nurul Huda Yapis Kindergarten offers several benefits: (1) children's personal experiences provide authentic learning opportunities, (2) the relevance of materials to daily life fosters easier connections with learning content, and (3) leveraging the environment actively engages children, promoting a deeper interest in science. This approach not only enriches children's learning experiences but also enhances their understanding of scientific concepts by grounding lessons in their everyday realities.

Method

This study explores the use of children's experiences as media, materials, and tools for science learning at Nurul Huda Yapis Kindergarten in Keerom Regency, employing a qualitative research methodology. This approach relies on primary and secondary data sources (Fadli, 2021). Primary data were obtained through direct observations conducted at Nurul Huda Yapis Kindergarten. These observations focused on how teachers utilized children's everyday experiences and life equipment to facilitate science learning. To ensure the validity of the observations, in-depth interviews were conducted with teachers, kindergarten administrators, and parents. Informal conversations were also held with children to explore their cognitive responses and emotional engagement with the learning activities. These interactions provided nuanced insights into the practical implementation of the learning model and its reception by both children and educators. Secondary data were sourced from various scientific literature and digital repositories, including Google Scholar, Mendeley, and ScienceDirect. The research also incorporated data and reports from official government institutions, such as the Central Statistics Agency, as well as relevant publications from private organizations. Additionally, information disseminated through print and electronic media was reviewed to provide a comprehensive understanding of the context and theoretical background. The collected data were systematically organized, sorted, and categorized based on their relevance to the research objectives. Specifically, the study sought to understand how children's daily life experiences and familiar surroundings serve as primary teaching media in science education. The data were

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narrated in a structured manner to highlight the relationships between observed practices and theoretical frameworks. This narrative approach was complemented by interpretive analysis, applying a dialectical process to connect empirical findings with broader scientific principles (Maiti & Bidinger, 1981).

By integrating direct observations, interviews, and secondary literature, the study aimed to construct a comprehensive understanding of how simple, everyday tools and experiences can enhance early childhood science education in resource-constrained settings.

Results and Discussion

Results

1. Equipment life daily as a learning medium science .

Draft science need introduced with Correct to child age early since early by parents and teachers. Attached and increasing ability child in carry out the science process with Correct is indicator key that science that has given to child age early has own meaning (Ma'viyah, 2021) . Therefore that , for teachers is very, very important know standards skills true science , and know skills which science is suitable and appropriate for child age early . At Nurul Huda Yapis Kindergarten Regency Keerom the teachers have give concepts science for child age early in accordance with themes / materials taught , including is :

a. Volume Material

Volume conservation is an activity designed to introduce children to the concept of liquid volume (Rohmah et al., 2022). At the pre-operational stage, children are not yet able to fully understand volume conservation. Therefore, this concept can be taught using practical, hands-on activities, such as filling containers with water. For example, children can fill a bucket using a dipper, allowing them to count the number of dips needed to fill the bucket. Similarly, they can transfer water between a small bottle and a large bottle or vice versa. These activities provide opportunities for children to explore and understand basic scientific concepts through observation and interaction. At Nurul Huda Yapis Kindergarten in Keerom Regency, using everyday tools to teach the concept of volume is crucial for creating a fun and interactive learning experience. Educational media, such as books with animations depicting volume measurement using various objects, are often employed. For instance, illustrations showing water being poured into containers of different shapes and sizes help children visualize that volume refers to the space occupied by a substance. These ideas are then reinforced through practical activities, such as using plastic bottles of varying sizes to measure and compare volumes. This combination of visual aids and hands-on practice makes learning engaging and accessible for young children.

Children are encouraged to pour water from one container to another to observe volume differences. This activity not only makes the concept of volume more tangible but also directly involves them in the measurement process. For example, teachers at Nurul Huda Yapis Kindergarten in Keerom Regency use bottles filled with small beads, allowing children to estimate and measure the volume of the contents. Although seemingly simple, this activity provides invaluable hands-on learning experiences, particularly for young children. Additional materials, such as sand, rice, or water, can also be utilized, while tools like plastic water bottles and ladles serve as practical aids. Through these activities, children learn about volume by filling and emptying containers. These exercises reinforce the understanding that the volume of a substance remains constant regardless of the container's shape or form, thereby solidifying an important scientific principle in an engaging and age-appropriate manner.

Picture 1 Child Filling Beads in Bottles with Different Volumes

Using everyday tools and materials makes learning about volume more engaging and relevant for children. Instead of merely listening to theoretical explanations, children can see, touch, and directly experience the concepts being taught. This hands-on approach is particularly important in kindergarten, as young children learn most effectively through direct experiences and interactions with their environment. By adopting this approach, children at Nurul Huda Yapis Kindergarten can develop a deeper understanding of volume concepts while simultaneously enhancing their motor and cognitive skills.

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a. Floating and Sinking Materials

The concept of floating and sinking is introduced to children to help them understand that not all objects placed in water will sink. Floating and sinking are determined by the density of the object, not its size (Supratiknyo, 2021). Various media, tools, and materials are used to teach this concept effectively. For instance, teachers at Nurul Huda Yapis Kindergarten in Keerom Regency incorporate examples from children's everyday experiences to make the learning process relatable. As Mrs. Asminah, a homeroom teacher for class B3, explained, "When I teach the concept of floating and sinking, I use examples from daily life, such as a duck that doesn't sink while swimming, a heavy ship that floats, and stones that sink despite being smaller. This often sparks enthusiasm among the children, leading them to ask questions like 'why does this happen?' This inquiry sets the stage for further discussions and deepens their understanding of the concept."

The use of everyday objects in children's daily activities has proven effective in visually explaining scientific concepts in an engaging way. In addition to media, various tools are utilized, such as water-filled containers, objects of different sizes, and measuring tools like rulers, to observe and measure the behavior of objects placed in water. Children are given opportunities to directly explore how the density of different objects influences whether they float or sink. Through hands-on experiments, they gain a practical understanding of the principles of buoyancy.

The materials used for these activities are simple, readily available items, such as pieces of wood, rubber bracelets, or plastic toys. Children are encouraged to test whether these objects float or sink when placed in water-filled receptacles. These activities help them identify the factors that influence buoyancy and deepen their understanding of the concept.

Integrating everyday objects into lessons about floating and sinking makes the learning experience more tangible and engaging for children at Nurul Huda Yapis Kindergarten in Keerom Regency. Children are not limited to verbal explanations but are also able to see and physically interact with the concepts as they occur in daily life. This interactive and practical approach enhances their understanding of science while also sharpening their observation and reasoning skills.

b. Soluble and Insoluble Matter

Not all objects dissolve in water. Some substances dissolve, while others do not. Soluble substances, such as salt, sugar, coffee, and tea, dissolve in water to form a solution. On the other hand, materials that do not dissolve in water, such as sand, oil, and rocks, form mixtures or sediment (Sari, 2021). In teaching this concept,

various forms of media, such as images or posters, are often used to illustrate the process of dissolving and non-dissolving substances in water. These visual aids help children understand the concept in a simple yet effective manner. In addition to visual media, tools like glasses, spoons, and whisks are utilized for experiments on solubility. Children are encouraged to observe and experiment by mixing different ingredients in water to determine whether they dissolve.

For example, common materials like table salt, sugar, flour, as well as sand, oil, and other non-soluble substances, are used in these experiments. Children are asked to mix these ingredients with water and observe whether they dissolve. Through these activities, they gain a practical understanding of the difference between soluble and insoluble materials, reinforcing the concept in an engaging and hands-on way.

Picture 2 Children doing experiments on solutions

By utilizing various everyday tools and materials, learning about solubility at Nurul Huda Yapis Kindergarten becomes more engaging and meaningful for children. Instead of merely listening to verbal explanations, children can see and directly experience how solubility occurs in their daily lives. Through this interactive and practical approach, children develop a deeper understanding of scientific concepts while also enhancing their observational and reasoning skills.

1. Reasons to use equipment life

Unlike schools in larger cities that typically have dedicated classrooms for various learning centers, including science centers equipped with specialized educational tools (Widayati et al., 2020), the situation at Nurul Huda Yapis Kindergarten in Keerom Regency is quite different. Located in a transmigration area far from urban centers, the kindergarten utilizes simple and locally sourced educational tools for teaching science. Teachers creatively make their own teaching aids using materials that are readily available in the surrounding environment and familiar to young children. This approach not only reduces costs but also helps children better

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understand scientific concepts by using tools they encounter in their daily lives (Palmin et al., 2021).

This approach aligns with the observations of Mrs. Asminah, a homeroom teacher for class B3 at Nurul Huda Yapis Kindergarten, who has extensive teaching experience at the school. She explained, “We don’t have a dedicated science center, ma’am. Before COVID, we tried creating separate rooms for each learning center, but we found it didn’t achieve the learning objectives as intended. Now, we integrate all centers into each classroom.”

A similar sentiment was expressed by Mrs. Pipin, the homeroom teacher for class B2, who stated, “Yes, ma’am, we don’t have a dedicated room for a science center, but we create educational tools ourselves whenever we want to practice science.”

The explanation provided by the informants highlights that introducing scientific concepts using simple materials and tools found in children's daily activities is tailored to both the children’s abilities and the resources available at the school. The science concepts taught include volume measurement, floating and sinking, and solubility. This approach aligns with the observations shared by Mrs. Asminah, the homeroom teacher for grade B3 at Nurul Huda Yapis Kindergarten in Keerom Regency. She remarked, “For educational tools, we make them ourselves, ma’am. They are very simple—we just use materials available in the surrounding environment. What else can we do? We don’t have permanent educational tools. But the children are very enthusiastic; they enjoy practicing science with these materials, even though they often get damaged because the children are curious.”

Referring to the information above, it can be concluded that the educational tools used are not permanent and are prone to damage due to their simplicity and frequent use. As a result, teachers often need to recreate the same educational tools for subsequent learning sessions. However, this challenge encourages teachers to be more creative, designing educational tools tailored to the specific needs and conditions of early childhood learners. The primary focus remains on effectively conveying the scientific concepts. Through the use of these tools, children are able to practice and internalize the concepts, ensuring that the learning objectives are achieved.

The use of everyday tools and materials in teaching topics such as volume, floating and sinking, and solubility at Nurul Huda Yapis Kindergarten in Keerom Regency is supported by several important reasons. First, the availability of simple, everyday materials, such as plastic cups, spoons, water, salt, and sugar, makes it easy and cost-effective for teachers to conduct practical activities. Second, the use of safe and non-hazardous materials is crucial to ensuring the safety and well-being of the

children. By selecting materials like water and common kitchen ingredients, the risk of accidents or injuries is minimized. Finally, incorporating various forms of media, tools, and materials actively engages children in the learning process. Hands-on activities that involve direct interaction with familiar materials encourage children to actively explore and experiment. This approach not only makes learning more enjoyable but also reinforces their understanding of scientific concepts. Therefore, the use of simple tools and materials in science education at Nurul Huda Yapis Kindergarten provides significant benefits by facilitating effective, safe, and engaging learning experiences for children.

Through direct experiences with everyday tools and materials, children can develop practical skills such as observation, measurement, and experimentation. They also learn to work collaboratively in groups, sharing ideas during activities, which strengthens their social skills. Additionally, the use of various media, tools, and materials supports differentiated learning, allowing teachers to adapt their instructional approaches to meet the individual needs of each child (Nisfa et al., 2022). This ensures that every child can actively engage in the learning process and achieve a thorough understanding of scientific concepts. Thus, the use of everyday tools in science education at Nurul Huda Yapis Kindergarten not only facilitates the comprehension of scientific principles but also helps develop a range of essential skills. These include practical, social, and cognitive abilities, which are crucial for the holistic development of young children.

2. Result of use equipment life

The use of everyday tools and materials in science learning at Nurul Huda Yapis Kindergarten in Keerom Regency has yielded significant and diverse results. First, children demonstrate improved understanding of scientific concepts such as volume, floating and sinking, and solubility (Education et al., 2023). The use of visual aids, including images and videos, combined with hands-on experiences using everyday materials, makes these concepts easier for children to understand and remember. Second, active participation in practical activities has enhanced children's practical skills (Cherniaieva, 2021). Through these activities, children learn to measure, observe, and perform basic analyses—essential foundational skills for science learning. By conducting experiments, they can directly observe the outcomes of their hypotheses, which fosters curiosity, critical thinking, and deeper engagement in the learning process. Third, using safe and easily accessible materials ensures that learning activities are both practical and risk-free. This approach allows teachers to repeat activities without concerns about material availability or safety risks (Wiyogo et al., 2020).

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Using children's experiences and their immediate environment directly in learning creates a more flexible and responsive educational environment that caters to the needs of young learners. Interaction and collaboration during practical activities enhance children's social skills and teamwork abilities. Through these activities, children learn to work in teams, share responsibilities, and discuss their observations, which helps develop their communication and collaborative skills. Overall, the use of various tools and materials in science learning at Nurul Huda Yapis Kindergarten not only improves children's academic understanding but also fosters essential practical and social skills crucial for their holistic development. This aligns with the practices implemented by the teachers at Nurul Huda Yapis Kindergarten in Keerom Regency. One of the teachers, Mrs. Alsum, a homeroom teacher for class B1, explained, "During every practical activity, we observe and record the children's progress on evaluation sheets. These include assessments of science process skills. Of course, these skills are essential, ma'am, as they allow us to monitor the children's development. For instance, whether a child can observe, group items (such as by color), or communicate and discuss with their peers. That's the essence of what we focus on."[1]

Discussion

1. Living Equipment Used For learning science

The use of various everyday tools in science learning at Nurul Huda Yapis Kindergarten in Keerom Regency is based on a clear underlying logic: to enhance children's understanding of concepts and develop practical skills through concrete and interactive methods. The rationale for using these tools can be summarized as follows:

a. Visualization Draft

Tools such as water-filled receptacles (e.g., dippers) and objects that float or sink help children observe scientific phenomena directly. For example, when learning the concept of volume, children can measure water using a measuring glass, providing them with a clearer understanding of size and measurement.

b. Experience Direct

Using practical tools for hands-on activities provides children with direct learning experiences. By conducting their own experiments, such as mixing materials to observe which substances dissolve and which do not, children can more easily understand the concept through active engagement rather than passive listening.

c. Increase Participation Active

[1]Interview with Mrs. Alsum on September 02, 2023 at Nurul Huda Yapis Arso 2 Kindergarten, Keerom Regency

Practical tools encourage children to actively participate in learning activities. For instance, using a spoon and ingredients like salt or sugar to explore solubility allows children to engage directly in the learning process, making the experience more interesting and motivating for them.

d. Development Skills Practical

The use of these tools helps children develop essential practical skills, such as measurement, observation, and analysis. Through hands-on activities, children learn to use measuring tools, record their observations, and draw conclusions from the experiments they conduct.

e. Security and Availability

The tools and materials used are typically safe and easily accessible everyday items, such as plastic cups, water, and common kitchen materials. This ensures that practical activities can be conducted safely, without requiring expensive or hard-to-obtain resources.

f. Facilitate Learning Interactive

These tools make learning more interactive and engaging. Children can interact with the materials and tools by asking questions, experimenting, and independently discovering answers to their inquiries. This process is crucial for fostering critical thinking and scientific curiosity.

The various factors outlined above demonstrate that the use of everyday tools and materials in science learning at Nurul Huda Yapis Kindergarten not only enriches children's learning experiences but also ensures a deeper and more holistic understanding of scientific concepts.

2. Living Equipment as tool game educative

Scientific concepts need to be introduced appropriately to young children by parents and teachers from an early age. The development of children's ability to engage in scientific processes is a key indicator that the science education they receive has meaningful value. Therefore, it is essential for teachers to understand the standards of scientific skills and to identify which scientific concepts are suitable and appropriate for young children. Introducing age-appropriate science concepts not only benefits children in their daily lives but also serves as a foundation for future learning at higher levels.

Based on interviews with three teachers at Nurul Huda Yapis Kindergarten in Keerom Regency, the kindergarten introduces scientific concepts aligned with the themes being taught. However, given the kindergarten's location in a

transmigration area, far from urban centers, the educational tools used for teaching science are very simple. Teachers create educational aids using everyday materials that are readily available in the environment and familiar to the children. This approach is highly effective, as it allows children to better understand scientific concepts by using tools they often encounter in their daily lives.

In urban kindergartens, larger facilities typically include dedicated classrooms for various learning centers, including science centers equipped with specialized educational tools. These science centers are designed to introduce scientific concepts to young children through structured activities. However, the situation is different at Nurul Huda Yapis Kindergarten. While the kindergarten initially created dedicated classrooms for learning centers, the limited availability of permanent educational tools and materials hindered the effectiveness of these facilities. As a result, the kindergarten opted to integrate all learning activities within the general classroom environment, prioritizing creativity and adaptability in utilizing available resources.

3. Understanding science child age early

Aligned with the foundational concepts that can be introduced to young children, several science process skills can also be developed to enhance their mastery of science. These skills include: (a) observing, (b) grouping, (c) communicating, and (d) inferring (drawing conclusions).

The objectives of a science learning development program are closely tied to the dimensions of science that emphasize character and personal development. The aim is to instill appropriate attitudes in children from an early age, as these form the foundation of their education and learning outcomes in science. Key attitudes fostered through science process skills include honesty, critical thinking, creativity, positivity, perseverance, and the ability to appreciate and accept input. These attitudes collectively shape what is often referred to as a "scientific attitude," which plays a crucial role in future scientific studies and inquiries.

Conclusion

The use of various forms of media, tools, and equipment in teaching science topics such as volume, floating, sinking, and solutions at Nurul Huda Yapis Kindergarten in Keerom Regency is both crucial and grounded in a strong logical rationale. These tools help to visualize abstract scientific concepts, making them more accessible and easier for children to understand. By directly interacting with laboratory equipment, children can connect theoretical knowledge to real-life experiences, which significantly enhances their conceptual understanding.

Furthermore, the use of laboratory tools actively engages children, increasing their participation and involvement in the learning process. When

children are directly involved in laboratory activities, they learn not only by listening but also through hands-on practice. This active engagement boosts their motivation to learn and helps them develop essential practical skills, such as observation, measurement, and analysis. Additionally, using safe, readily available materials ensures that learning activities can be conducted with minimal risk and low cost.

Overall, the integration of various tools in science learning at Nurul Huda Yapis Kindergarten creates a more interactive, effective, and meaningful learning environment. These tools support differentiated learning, facilitate collaboration, and foster the development of children's social and practical skills. As a result, this approach not only enriches children's academic understanding but also promotes holistic development, equipping them for more complex learning in the future.

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