

STIMULATING EARLY CHILDHOOD CREATIVITY WITH SIMPLE EXPERIMENTAL METHODS

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ABSTRACT

Creativity is a person's competence in producing a new breakthrough, both in terms of ideas and tangible works, that has uniqueness compared to old findings. This research is intended to objectively describe the application of experimental methods as a means to stimulate the creativity of young learners at TK IT Nurul Ilmi. The type of research used in this study is field research with a qualitative descriptive approach. Data in this research were collected through three main techniques: observation, semi-structured interviews, and documentation. The subjects of this research are early childhood children aged 5 to 6 years located in the Science Centre at TK IT Nurul Ilmi. This study involved 18 students who were purposively selected, with additional data from two informants, namely the class teacher and the supporting teacher. The results of the analysis are reported in narrative form. The data analysis began with the collection of all data, followed by reduction, presentation, and finally verification. The truth of the data in this research was tested using triangulation techniques, namely by utilising various sources and applying different methods. The types of experimental activities include solar eclipse experiments, colour diffusion experiments, salt evaporation experiments, and secret message experiments. The findings of this study indicate that the use of simple experimental methods as a stimulus for the creativity of early childhood at TK IT Nurul Ilmi can enhance children's thinking skills, creativity, curiosity, and imagination.

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INTRODUCTION

Stimulating creativity in early childhood is very important for their cognitive and motor development. According to (Robiyatul Adawiyah et al., 2024), this process is necessary to hone children's critical thinking, problem-solving, and innovation skills. However, many young children lack adequate creative stimulation, resulting in under-optimization of their creative abilities. Therefore, the application of effective learning

methods, such as simple experiments, is essential. Through experimentation and direct observation of the results, children can be stimulated to hone their creativity and critical thinking.

The scope of early childhood development is closely related to creativity, which requires strong support for physical, intellectual, and emotional growth (Sit et al., 2016). The cognitive aspect that influences creativity is manifested through divergent thinking capacity, namely the ability to produce various alternative answers to a problem (Dere, 2019). Meanwhile, emotional intelligence plays a role in building perseverance and resilience when faced with uncertain situations. The role of educators in this context is fundamental, where teachers are required to provide active stimulation to explore children's full creative potential (Nurfuady et al., 2019).

Although the importance of early childhood creativity has been widely recognized, in practice, various obstacles remain in optimally stimulating it (Anjani, 2024). One major problem is educators' lack of understanding and skills in implementing learning methods that encourage children's creativity. Furthermore, conventional learning methods, which tend to be teacher-centered and lack active child involvement, often limit children's exploration and experimentation. As a result, children's creative potential is not fully explored. Furthermore, limited facilities and infrastructure in many early childhood education institutions also pose a challenge in implementing simple experimental methods that require supporting tools and materials.

The simple experimental method is a learning method that allows children to conduct experiments and observe the results. This method provides children with the opportunity to explore and prove their own hypotheses, thus helping them develop creative and critical thinking skills (Harlistyarintica & Muryani, 2024). Simple experimental methods can include activities such as testing chemical reactions, observing weather changes, or examining the properties of objects (Fitasari & Mustikasari, 2023).

Several previous theories and studies support the importance of simple experimental methods in stimulating creativity in early childhood. Through constructivism theory, Jean Piaget argued that children's learning process is not a passive reception of information, but rather the result of their active engagement with the world around them. Experimentation and exploration play a crucial role in constructing new knowledge. Furthermore, Vygotsky, with his scaffolding theory, emphasized that through the support of a mentor or more skilled peer (scaffolding), children can complete tasks they cannot yet complete on their own, such as in simple experiments, thereby maximizing their potential (Susanti et al., 2024).

Previous research conducted by (Kurnia Juita et al., 2024) showed that by experimenting with mung bean sprouts, children can learn about scientific phenomena. The findings of the study (Ashari et al., 2024) demonstrated the effectiveness of the science experiment method. Its success was demonstrated by the average score of children's social-emotional aspects, which was 3.95. This figure falls into the categories of BSH (Developing According to Expectations) and BSB (Developing Very Well). Previous research emphasized the cognitive and social-emotional aspects, so this study explores how simple experiments can be a tool to stimulate creativity, imagination, and the ability to think in children. By designing experiments that involve the processes of exploration, problem-solving, and self-expression, the significance of this study is twofold: first, it enriches the treasure trove of experimental methods in early childhood education, and second, it pioneers an integrated learning strategy that encapsulates the disciplines of science and creativity.

This research also makes a significant contribution in today's era, where the ability to survive and excel in facing global challenges requires breakthroughs born of creativity and innovation, such as climate change, technological advancement, and social change. By fostering creativity from an early age, this research plays a role in producing a creative, innovative, and resilient generation in facing the challenges of the times. Furthermore, this research can also help address issues such as the lack of creative and innovative abilities among children, which can impact their ability to compete in the global job market.

The indicators to be researched in this study are: (1) children's ability to identify simple problems or questions that arise during the experimental process, (2) children's level of participation and enthusiasm in following the experimental steps, (3) children's ability to put forward simple hypotheses or predictions related to the experimental results, (4) children's creativity in exploring various methods or solutions during the experimental process, and (5) children's ability to draw simple conclusions from the experimental results.

Previous research still has several limitations, such as the lack of research examining the experiences and perceptions of children aged 5-6 years in participating in simple experimental learning. This study aims to describe and illustrate the effective implementation of simple experimental methods to stimulate creativity in children of this age. Furthermore, the study also describes the application of these methods to stimulate children's creativity and serves as a guide for educators and parents in honing their

children's creative abilities. It is hoped that the research findings can contribute to the development of higher-quality and more effective early childhood education.

RESEARCH METHODS

This research was conducted at the Science Center, Nurul 'Ilmi Kindergarten, located on Jalan Kolam, UMA Complex. The subjects included all Group B students at the center, with a total of 18 children: 11 boys and 7 girls. The study lasted for approximately one month, from April 18, 2025, to May 15, 2025.

This study employed a qualitative approach because it allows for in-depth exploration of children's processes, experiences, and interactions during experimental activities, which are difficult to measure quantitatively. This study aimed to understand how children's creativity is stimulated through simple experimental methods, thus requiring a holistic and contextual analysis of the behaviors, responses, and dynamics that emerged during the activities (Sugiyono, 2019). The following details the research methods used:

The subjects of this study were students aged 5-6 years old at the Nurul 'Ilmi Kindergarten Science Center. The sample was selected purposively, selecting participants based on predetermined criteria and considerations, children who had the opportunity to participate in simple experimental activities. A total of 18 students participated, with two teachers, the class teacher and a mentor teacher, serving as supporting informants to provide additional perspectives.

In this study, the researcher acted as a key instrument. Their role involved collecting data through three main techniques: observation, semi-structured interviews, and documentation.

1. Field Research (Observation) Method: Monitoring children's activities during a simple experiment.
2. Semi-structured Interview Guide: Interviews were conducted with teachers using a guide to gather information about the development of children's creativity.
3. Documentation: Photos and videos of the experimental activities were collected to serve as physical evidence to support data analysis.

The data were analyzed using thematic analysis. The collected data were then transcribed and coded based on emerging patterns, such as "creative expression," "children's interests," or "teacher roles." These codes were grouped into broader themes. These themes were analyzed in depth by connecting them to theory and the research

context, then interpreted to understand how simple experimental methods can stimulate children's creativity. The analysis of the results was reported in a narrative format derived from direct quotations from the data, and validation of the findings was carried out through triangulation or member checking to ensure the accuracy of the interpretations. Thus, thematic data analysis helped reveal patterns and deeper meanings about the impact of simple experiments on the development of creativity in early childhood.

To ensure data validity, triangulation of sources and methods was conducted by comparing the results of observations, interviews, and documentation. This research method is expected to provide a comprehensive understanding of how simple experimental methods can stimulate creativity in early childhood.

RESULT AND DISCUSSION

Based on data obtained from observations, teachers at Nurul 'Ilmi IT Kindergarten apply the experimental method as an effort to develop students' creativity, as revealed in the results of interviews by researchers with class teachers (RL), he said that creativity in early childhood is simple but for them it is very interesting, especially in the field of experiments. Conducting experiments is actually simple, the materials are also safe and simple for children. Things that they previously did not know become known, children are more interested and usually the experiments are not boring. Early childhood knowledge can be increased in a simple way, namely through the experimental method which is often applied by teachers at this kindergarten. This method not only helps develop children's creativity and imagination, but also trains them to think more logically, critically, and enjoy observation activities. In the view of modern schools, the surrounding environment functions as a natural laboratory rich in learning resources. Thus, through experiments, children's curiosity can increase while fostering their admiration for the universe, science, and God.

Experimentation plays a crucial role in stimulating children's sense of wonder at natural phenomena, thus instilling intrinsic motivation for continuous learning. Furthermore, the process of experimenting fosters creative development, enhances logical reasoning, and cultivates observant skills. This, in turn, fosters curiosity and enables children to produce innovative discoveries or projects that are entirely new to them. Effective learning occurs when children are directly involved in the learning process and not only understand concepts but also develop skills (Ananda et al., 2023).

According to Yeni Rachmawati and Eusi Kurniati, there are several things that IT Nurul 'Ilmi Kindergarten teachers must do to be able to conduct experiments, including:

(1) Helping children explore their interests and apply them to real problems. (2) Encouraging children to be diligent in finding out for themselves, not just being given information. (3) Guiding children to make simple conclusions. Children's creativity can be optimally balanced when they receive stimulation from parents and teachers (Utami et al., 2023).

In order to develop the creativity of early childhood, the teachers at Nurul 'Ilmi IT Kindergarten have prepared several strategies for carrying out experiments, including (1) choosing a simple problem, (2) observing and analyzing whether the problem can be answered experimentally, (3) determining the topic and scope of activities, (4) observing and identifying the objects being studied, (5) conducting dialogue and questions and answers to encourage children to develop their activities, (6) encouraging children to draw simple conclusions from the experiments they have carried out.

The main goal of this experimental activity is to stimulate children's creativity. In her research, Fajriyyah stated that children are characterized by high fantasy, selfishness, uniqueness, a love of interesting things, and curiosity. (Eviyatul Fajriyyah & Nur Fajrie, 2022) In the early stages of their development, children need a supportive learning environment that can stimulate curiosity. Once this foundation is established, children will be able to develop activities and discover new creative ideas independently. These are the reasons teachers implement this type of simple experiment at Nurul 'Ilmi IT Kindergarten, including the following:

1. Solar Eclipse Experiment

A simple solar eclipse experiment can be performed to understand this natural phenomenon. The experiment involves a ball, a flashlight, and a dark room to simulate the positions of the Sun, Earth, and Moon. By lining up the three objects in a straight line and shining the flashlight on the smaller ball (the simulated moon), we can observe how the sunlight is blocked and creates a shadow, similar to a solar eclipse.



Source: <https://drive.google.com>

(Figure 1. Children conducting a solar eclipse experiment)

The tools and materials used include a large ball (earth simulation), a small ball (moon simulation) and a flashlight (sun simulation). Then the teacher explains the rules of the game to the children such as placing a large ball, a small ball, and a flashlight on the floor or table in a straight line, turning on the flashlight and directing the light at the small ball (moon), inviting the children to observe the shadow formed on the large ball (earth), the teacher instructs if doing this experiment in a dark room for clearer results.

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This simple experimental activity aims to visually prove the occurrence of a solar eclipse, understand the position of the sun, earth, and moon when the eclipse occurs, and observe how sunlight is blocked by the moon and creates a shadow on the earth.

2. Color Propagation Experiment

The lesson began with the children lining up in the schoolyard, then doing gymnastics, reciting morning prayers, after which they entered the classroom to read prayers and eat together. At the beginning of the activity, an apperception was carried out in the form of memorization activities, memorizing hadiths, singing together, and continued with a question and answer session regarding the benefits of water for bathing. The main activity began with an introduction to the tools and materials that would be used for the "Color Propagation" experiment. The materials used included used plastic bottles, tissues, water, and blue, yellow, and red food coloring.



Source: <https://drive.google.com>

(Figure 2. Children conducting a color propagation experiment)

The experiment begins with the teacher demonstrating how to conduct the experiment in front of the children. The teacher pours water into used plastic bottles, then adds red food coloring to one bottle and another. Next, one dye is transferred using a tissue to the other. For example, the teacher might demonstrate by asking, "Now, try transferring yellow to blue. What color will the result be?".

All children conducted experiments and named the colors they found. The children then grouped the objects according to the colors they found. This experimental activity aimed to enhance their understanding of color, develop cognitive and fine motor skills, and stimulate curiosity and creativity.

At the end of the activity, the children sang a song related to the learning theme. Afterward, the teacher and students reflected together on all the activities they had completed. The teacher guided the conversation by asking about the various colors they had observed during the conversation or experiment. Next, the teacher delivered a moral message to the children, followed by a question-and-answer session about the various activities they had done throughout the day. The teacher also asked the children how they felt during the playtime.

3. Salt Evaporation Experiment

Tools and materials used: The teacher provides a worksheet, cotton buds, water, salt, a plastic plate, and a brush. The teacher demonstrates the process of making a salt solution and invites the children to observe. The teacher begins writing using cotton buds that have been dipped in a plate containing salt solution and then writes it on blank paper. The teacher shows the children the results of the writing after it dries.

All activities were carried out with enthusiasm and a keen curiosity about the evaporation of salt. These experiments aimed to improve fine motor skills, foster curiosity, increase focus, and provide a fun learning experience through exploration. The teachers then invited the children to participate directly in the experiments. This activity generated great enthusiasm among the children, who participated in the simple experiments prepared by the teachers.



Source: <https://drive.google.com>

(Figure 3. Children conduct a writing experiment with Salt Evaporation)

4. Secret Message Experiment

Tools and materials used: The teacher provides a worksheet, white candle, water, Betadine, and a plastic plate and brush. The teacher demonstrates the process of making Betadine solution and invites the children to observe, the teacher starts writing using candle wax on blank paper then dips it into a plate containing Betadine solution to see the results of the writing that appears on the paper. The teacher shows the children the results of the writing when the paper is in the plate. This simple experiment aims to stimulate children's cognitive abilities, creativity, and problem-solving skills, while introducing basic science concepts in a fun way.

This activity is carried out with full expression and a sense of amazement at the messages or writings that were previously invisible becoming clear.



Source: <https://drive.google.com>

(Figure 4. Children conducting the Secret Message experiment)

The teacher then invited the children to conduct a hands-on experiment. This activity made the children very enthusiastic about carrying out the simple experiments the teacher had prepared.

Based on observations over a month, the simple experimental activities implemented were designed with specific strategies by the teacher. These strategies included selecting simple problems, determining themes and activities, observing activities, and conducting interactive dialogue through questions and answers to optimize the learning and development process for children. Experiments, which involve the systematic study of something through testing and research, serve as a means of gaining knowledge and understanding. Through experiments, children can improve their problem-solving skills and enhance their knowledge of various subjects (Anjani, 2024).

In supporting experimental activities, the teacher's role is to facilitate children's discovery of their interests and their application in their daily lives, using various media available around the school. This strategy is effective in stimulating children's curiosity through simple experiments. (Sue et al., 2021) states that the experimental method is highly applicable to young children because it is easy to understand and highly effective in teaching the concept of cause and effect. The long-term impact is the development of strong logic and analytical skills, which will help children understand and solve various problems in their lives.

By experimenting is a way of delivering learning when children do experiments by meeting and demonstrating themselves what they have learned (Addini & Widayarsi, 2022). Before carrying out experimental activities for early childhood, there are 3 stages that are designed, such as the preparation stage, the implementation stage, and the experimental follow-up stage.

Before carrying out an experiment, teachers need to carry out a series of preparations starting with formulating objectives based on the RPPH. Next, for the smooth running of the activity, teachers prepare tools, materials, and places, and ensure everything is sufficient for the number of children to ensure safety and health in the experimental process so that no risks occur, and teachers provide clear explanations and rules for using tools and materials to students, and explain in detail each stage that will be carried out by students.

During the experiment, students carried out activities according to the instructed stages. Using prepared materials, they worked in groups to observe various phenomena that emerged, all under the guidance and supervision of the teacher. This aligns with Vygotsky's argument in his book, *Mind in Society*, which states, "What a child can do in cooperation today, he can do alone tomorrow" (Vygotsky, 1978). Apart from that, he also said, "Children can only develop their potential through a learning process that involves

interaction and cooperation with the people around them, both adults and other children" (Vygotsky, 1978).

The learning process proceeds in an orderly and directed manner. The teacher's role is crucial in providing guidance and instilling the values of queuing and taking turns, which directly develop children's social-emotional skills and character. To conclude the session, the teacher invites the children to reflect on the activity through discussion and fosters a sense of responsibility by tidying up all the equipment together.

Experimentation is a way of conveying learning when children conduct experiments by encountering and demonstrating for themselves what they have learned. This finding is supported by Piaget's statement in his book *The Origins of Intelligence in Children* that "Children only have true understanding of what they create themselves, and every time we try to teach them something too quickly, we prevent them from recreating it" (Piaget, 1952).

Several previous theories and studies support the importance of simple experimental methods in stimulating creativity in early childhood. The core of Jean Piaget's constructivist theory is that learning is an active process; children construct their own knowledge through direct interaction with the environment, rather than simply passively receiving knowledge, where experimentation and exploration play a crucial role in building new knowledge. Furthermore, Vygotsky, with his scaffolding theory, emphasized that with the help of adults or learning with friends, a child can develop all of his abilities very well and become more competent, including in the context of simple experiments (Susanti et al., 2024).

Based on observations, the children's enthusiasm for learning demonstrates their increased creativity. This conclusion was drawn from direct observations by researchers over a period of approximately one month. Nurul 'Ilmi IT Kindergarten provided data confirming this. Simple experimental activities with a different theme each week were effective in stimulating children's creativity.

CONCLUSION AND SUGGESTIONS

Experimental activities can stimulate creativity in children. They play a crucial role in awakening and nurturing the creative talents children already possess from an early age, ultimately fostering fundamental creative attitudes such as wonder, imagination, curiosity, and the ability to ask questions. Beyond these benefits, these activities are also enjoyable for children, can stimulate a passion for learning, and provide concrete experiences that enrich their understanding of the material being taught.

Therefore, it is fitting that the focus of experimental activities for early childhood should not simply be on maintaining these qualities, but rather on continually improving their quality. The goal goes beyond simply fostering creativity; it is an investment in preparing the next generation to be adaptive in the face of global change. When implemented effectively, this method will yield a variety of positive benefits, including fostering critical thinking, stimulating innovation, and unlocking hidden talents. This foundation will ultimately produce quality individuals capable of making meaningful contributions throughout their lives.

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