APPLICATION OF SIMPLE SCIENCE EXPERIMENTAL METHODS THROUGH ECOPRINT ACTIVITIES TO IMPROVE THE COGNITIVE ABILITIES AND CREATIVITY OF EARLY CHILDREN AT NADA ASHOBAH IT KINDERGARTEN

Titien Ruswanti*
Fakultas Ilmu Pendidikan, Universitas Negeri Surabaya, Indonesia
E-mail: titien.23015@mhs.unesa.ac.id

Rachma Hasibuan
Fakultas Ilmu Pendidikan, Universitas Negeri Surabaya, Indonesia
E-mail: rachmahasibuan@unesa.ac.id

Abstract

An effective learning method to stimulate children's cognitive abilities and creativity is simple science experiments, such as ecoprint activities. Ecoprint is a printing technique using natural materials such as leaves and flowers, which can enhance children's cognitive abilities and creativity. The purpose of this study is to improve the cognitive abilities and creativity of Group B children through the enjoyable activity of ecoprint. This study uses a descriptive qualitative approach and was conducted at TK IT Nada Ashobah Wiyung Surabaya, with Group B children as the subjects. Data was obtained through observation and interviews with Group B teachers, then analyzed using the Miles and Huberman data analysis model, which consists of data collection, data reduction, data presentation, and conclusion drawing/verification. The results of the study show that ecoprint activities can improve children's cognitive abilities and creativity. Children learn to recognize the characteristics of various plants, observe, analyze, and combine leaf shapes to create interesting pictures. This activity also develops critical thinking and problem-solving skills, as well as increases children's curiosity and exploration.

Keywords: *Cognitive, Creativity, Ecoprint*

INTRODUCTION

Early childhood education is a development effort directed at children from birth to the age of six. This is done by providing educational stimulation to support children's physical and spiritual growth and development, so that they are ready to continue to the next level of education (Hadini, 2017). Early childhood is a child at the vulnerable age of 0-6 years, who has unique characteristics and is different from adults. The age of 0-6 years is the beginning of a child's life, because at that age very important processes are taking place, namely growth, development, refinement and maturation. This event is often known as the golden age (Aprida & Suyadi, 2022).

Early childhood is a very important developmental phase in a person's life. At this time, children are in the process of forming their cognition. Therefore, it is important to provide appropriate and adequate education to help them develop their cognitive abilities well. One way to provide effective stimulation is through interactive and fun learning methods, such as simple science experiments. The simple science experiment method is an approach that combines practical activities with basic scientific concepts that are conveyed easily by children. This approach not only stimulates children's cognitive abilities, but can also develop their creativity. Children are encouraged to explore, observe and experiment, all of which contribute to the development of critical thinking and problem solving skills.

Applying the science experiment method, children can directly interact using activities provided by the teacher, therefore it requires children who are able to know and understand scientific or scientific concepts (Mustika & Nurwidaningsih, 2018). Science for early childhood studies knowledge in the form of facts or symptoms from the surrounding environment and also how this various knowledge becomes useful for life, simple science experiments will help children experiment, explore, observe the environment, spread scientific nature in children's personalities, teach them to solve cases and analyze more about the things around them (Zahro et al., 2019). Science in early childhood is designed to inspire children to play and explore the environment (Widayati et al., 2021).

One learning model based on local wisdom designed by PAUD teachers to create fun learning is through ecoprint activities. Ecoprint is the activity of transferring color and shape by attaching plants with colored pigments to fibrous fabric with direct contact. Selection of plants that are sensitive to heat is an important factor in extracting color pigments. Learning activities by sticking and playing with colors are fun activities for young children. The plant elements that can be used for ecoprint techniques are flowers, leaves, stems, bark, fruit and roots (Susanti et al., 2021).

Ecoprint is a printing technique using natural materials such as leaves, flowers and other plants. This method involves the process of printing on paper or fabric using these natural materials to print beautiful and unique patterns. Apart from being a fun activity, ecoprint also has significant benefits in improving the cognitive abilities of young children. Ecoprint activities can improve the creative abilities of young children. This is because ecoprint is a form of fine art that uses natural materials as a medium. Through these natural materials, children can be creative according to what they want.

Children's creative abilities can be developed through simple science experiment methods such as ecoprint activities. Ecoprint is a form of fine art that uses natural materials as media (Khaeriyah et al., 2018). Through ecoprint activities, children are invited to try new things that they have never done before, thereby giving them new experiences. The natural materials used in ecoprint are safe and attractive for children. Ecoprint training at PAUD is designed to involve children in playing with the plants around them and using absorbent cloth. This allows children to take part in interesting learning and experience changes in their development, especially in terms of creativity. With ecoprint, children's

art and creativity can be explored and developed from an early age, according to their developmental expectations.

Previous research shows that playing science can trigger and develop creativity in children (Kharishma & Septiana, 2019). Other research also shows that the science learning environment has an impact on children's creative thinking and their imagination in self-actualization during learning activities (Herlina et al., 2018). Through science experiments with children, they can get to know scientific concepts not only theoretically, but also by asking questions such as what, when, who, so that children can find the answers themselves through the experimental activities they carry out. Experiments are activities that allow children to be involved in various activities, both playing and other activities.

Ecoprint can also improve the cognitive abilities of young children. This is in accordance with the research results of Yuandana and Dias (Arika & Munawarah, 2023) explaining that ecoprint batik activities can also stimulate other aspects of development including social, cognitive, motoric, moral, religious and artistic values. This shows that ecoprint batik has benefits for early childhood development and is safe for use by young children because it does not use dangerous chemicals. According to Prayitno, (2019) wrote that teachers must accompany and guide children so that they can be creative according to their wishes. In this activity, children are stimulated to hone their thinking and creative (cognitive) skills so they can create works of art appropriate to their age and stage of development. As an illustration of learning activities.

Through ecoprint activities, children can learn about various science concepts such as botany, color and texture. They can observe and learn how leaves and flowers leave traces on paper or fabric, and how colors and textures change as the printing process occurs. The ecoprint printing process also involves using simple tools such as a wooden hammer or stone to press the natural materials onto the printing medium. Children will develop their fine motor skills as they learn to use these tools properly. They will also learn about the forces and pressures required to produce good prints.

Apart from that, ecoprint activities can also involve observation, classification and analysis. Children can observe and study different types of leaves and flowers, classify them by shape and size, and analyze the resulting prints. This will give them a better understanding of the world around them.

Based on the results of observations made by researchers at the IT Nada Ashobah Wiyung Kindergarten in Surabaya, it shows that the creativity and cognitive level of group B children is in the "Starting to Develop" category. Teachers stimulate children's creativity by just drawing on paper so that children do not get new experiences. Teachers also stimulate cognitive abilities by using children's worksheets. This also makes children less enthusiastic when participating in learning.

In accordance with the problems above, researchers are interested in implementing simple science experiments through ecoprint activities to improve the cognitive abilities and creativity of group B children at the Nada Ashobah Wiyung IT

Kindergarten, Surabaya. The aim of this research is to improve the cognitive abilities and creativity of group B children through fun activities, namely ecoprint.

RESEARCH METHODS

This research uses a qualitative descriptive approach, which aims to systematically describe or describe a fact by paying attention to characteristics, quality and interrelationships between processes (Sugiyono, 2015). The location of this research is TK IT Nada Ashobah Wiyung Surabaya. The research subjects were group B children. The data source in this research was primary data obtained through observations and interviews with group B teachers.

Data collection techniques used include observation, interviews and documentation. The data analysis technique used in this research consists of four stages in the Miles and Huberman data analysis model, namely data collection, data reduction, data presentation, and drawing conclusions/verification regarding the application of simple science experiments through ecoprint activities to improve children's cognitive abilities and creativity. group B at Kindergarten IT Nada Ashobah Wiyung Surabaya.

RESULTS AND DISCUSSION

The use of creative and interactive learning methods is very important in early childhood education. One method that is attracting attention is ecoprint, which is a printing technique that uses natural materials such as leaves and flowers. At TK IT Nada Ashobah Wiyung Surabaya, ecoprint activities have been implemented in group B with the aim of improving the cognitive abilities and creativity of children aged 5-6 years.

In this discussion, we will explore how ecoprint is applied, its influence on children's cognitive development and creativity, as well as the challenges and benefits of this method. Ecoprint activities at TK IT Nada Ashobah involve the use of several types of plants, namely young papaya leaves, young cassava leaves, dollar flower leaves, hibiscus leaves, and sweet potato leaves. The process of this activity begins with an explanation from the teacher regarding the objectives and steps to be taken.

Children are then given the freedom to choose the plants they will use. The teacher accompanies and provides guidance during the activity, but still gives children the freedom to be creative. Children choose different types of leaves and modify them to create interesting pictures.

In the ecoprint process, the leaves are attached to cloth and hit with a block so that the resulting image is sharper. Observations show that the children are very enthusiastic and actively involved in this activity. Children's cognitive abilities can develop well through ecoprint activities.

During this activity, children are invited to think critically, creatively and collaboratively about how to combine various leaf shapes to create interesting images. This process involves various cognitive aspects, including observation, analysis, and synthesis of information. Children observe the different shapes, textures and colors of

leaves. They learn to recognize the characteristics of each plant and how these characteristics can be used in ecoprints. Ecoprint activities can also increase children's curiosity so they explore and experiment with existing materials.

Children analyze the shape of the leaves and decide how they want to use them. They choose leaves that match the concept of the image they want to create. Children arrange the leaves on a cloth and hit them with blocks to create pictures. This process involves creativity in arranging and combining various elements to achieve the desired result.

Based on interviews with group B teachers, ecoprint activities can stimulate children to think critically. Teachers give children freedom to choose plants and be creative, which allows children to develop problem solving and decision making skills.

Creativity is an important aspect of early childhood development. Ecoprint activities provide opportunities for children to express themselves and be creative with natural materials. Freedom in choosing plants and how to arrange them encourages children to think outside the box and produce unique works. Children are free to express their ideas and imagination through the pictures they create. Each child can produce different works even though they use the same materials.

Ecoprint activities encourage children to imagine various possibilities in arranging these leaves. Children's imaginations develop as they try different combinations and techniques to create desired images. Through ecoprint, children learn to appreciate and understand the beauty of nature. They realized that natural materials could be used to create art, which also taught them about sustainability and conservation.

Ecoprint activities provide many benefits, namely (1) ecoprint helps improve children's cognitive abilities and creativity through exploration and experimentation, (2) children learn to appreciate and use natural materials, increasing environmental awareness, (3) this activity is very interactive and involves children actively, increasing interest and motivation to learn.

Ecoprint activities also provide challenges for teachers, namely (1) the availability of leaves and other suitable natural materials can be a challenge, especially in areas that lack a variety of plants, (2) teachers need to be trained to use this method effectively and understand how to facilitate children's creativity without too much intervention, (3) ecoprint activities require sufficient preparation and longer time than conventional learning methods. The following is documentation of ecoprint activities:

Figure 1. Ecoprint activities

Science is a branch of natural science that includes content and processes. In science activities, children gain knowledge about nature and the phenomena around them. Children's scientific attitudes develop when they practice science in learning, which involves developing critical thinking and problem solving skills in everyday life. Children start from simple things by exploring and asking questions through observation and experimentation (Husin & Yaswinda, 2021).

Science activities can improve children's scientific process skills, including observing, discovering and solving problems (Dilek et al., 2020). In the ecoprint technique natural resources use plants, such as flowers and leaves which are placed on a white cloth and then beaten so that The plant essence seeps into the fabric naturally. Nature can be a source of inspiration for creativity. For this reason, the use of natural materials as the main material for making works, one of which is ecoprint fabric (Putri et al., 2023).

Developing creativity in early childhood is an important aspect of early childhood education. Creativity is not only related to art and expression but also to critical thinking skills, problem solving, and innovation. The ecoprint technique has emerged as an effective method for developing children's creativity. Studies conducted in kindergarten. I.T. Nada Ashobah, Wiyung Surabaya provides empirical evidence regarding the effectiveness of ecoprint techniques in developing creativity in children aged 5-6 years (Safitri et al., 2023).

The ecoprint technique has been proven to be effective in developing the creativity of children aged 5-6 years. Through an interactive and fun approach, children not only learn about art and science but also develop critical thinking, problem solving and innovation skills. The increase in scores from the first to the last treatment shows that children are increasingly creative and skilled in using ecoprint techniques.

Ecoprint provides a holistic learning experience, combining cognitive, motoric and emotional aspects of children. With the right support and guidance, these techniques can be implemented widely in early childhood education to make a significant contribution to the holistic development of children.

CONCLUSION

Ecoprint activities at TK IT Nada Ashobah Wiyung Surabaya have shown positive results in improving the cognitive abilities and creativity of young children. This method provides an interactive, fun and educational learning experience. By utilizing natural materials, ecoprint not only teaches children about science and art, but also instills the values of sustainability and respect for nature. Through appropriate training and support, ecoprint activities can be implemented widely and effectively in early childhood education, making a significant contribution to children's holistic development.

REFERENCES

Aprida, S. N., & Suyadi, S. (2022). Implementasi Pembelajaran Al-Qur'an Terhadap Perkembangan Nilai Agama dan Moral Anak Usia Dini. *Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini*, 6(4), 2462–2471. https://doi.org/10.31004/obsesi.v6i4.1959

Arika, & Munawarah, S. (2023). Meningkatkan Kreativitas melalui Kegiatan Membatik Ecoprint Anak Usia 5-6 Tahun. *PAUD Lectura: Journal of Early Childhood Education*, *6*(2). https://doi.org/10.31849/paud-lectura.v%vi%i.11287

Dilek, H., Tasdemir, A., Konca, A. S., & Baltaci, S. (2020). Preschool Children's Science Motivation and Process Skills during Inquiry-Based STEM Activities. *Journal of Education in Science, Environment and Health*, *6*(2), 92–104. https://doi.org/10.21891/jeseh.673901

Hadini, N. (2017). Meningkatkan Kemampuan Membaca Anak Usia Dini Melalui Kegiatan Permainan Kartu Kata Di Tk Al-Fauzan Desa Ciharashas Kecamatan Cilaku Kabupaten Cianjur. *Jurnal Empowerment*, *6*(1), 19–24. http://www.e-journal.stkipsiliwangi.ac.id/index.php/empowerment/article/view/370

Herlina, M. S., Dartono, F. A., & Setyawan. (2018). Eksplorasi Eco Printing Untuk Produk Sustainable Fashion. *Jurnal Kria Isi Surakarta*, *15*(02), 118–1130. https://jurnal.isi-ska.ac.id/index.php/ornamen/article/view/2540

Husin, S. H., & Yaswinda. (2021). Analisis Pembelajaran Sains Anak Usia Dini di Masa PANDEMI Covid-19. *Jurnal Basicedu*, *5*(2), 581–595. https://doi.org/10.31004/basicedu.v5i2.780

Khaeriyah, E., Saripudin, A., & Kartiyawati, R. (2018). Penerapan Metode Eksperimen dalam Pembelajaran Sains untuk Meningkatkan Kemampuan Kognitif Anak Usia Dini. *AWLADY: Jurnal Pendidikan Anak* , *4*(2), 102–119. https://www.syekhnurjati.ac.id/jurnal/index.php/awlady/article/view/3155

Kharishma, V., & Septiana, U. (2019). Pelatihan Teknik Ecoprint Untuk Guru PAUD. *Prosiding: Seni, Teknologi, Dan Masyarakat*, *2*, 183–187. https://dipro.isi-ska.ac.id/index.php/SemHas/article/view/119

Mustika, Y., & Nurwidaningsih, L. (2018). Pengaruh Percobaan Sains Anak Usia Dini terhadap Perkembangan Kognitif Anak di TK Kartika Siwi Pusdikpal Kota Cimahi. *Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini*, *2*(1), 94–101. https://www.obsesi.or.id/index.php/obsesi/article/view/12

Prayitno. (2019). Pembelajaran batik tetes lilin sebagai alternatif teknik membatik sederhana pada mahasiswa PAUD. *Jurnal Pendidikan Anak*, *8*(1), 38–47. https://journal.uny.ac.id/index.php/jpa/article/view/26678

Putri, S. W. D., Heldanita, Marlisa, W., Arifin, Z., Nurhayati, Sariah, & Suryanti, D. S. (2023). Meningkatkan Kreativitas Anak Usia Dini melalui Teknik Ecoprint. *PAUD Lectura: Journal of Early Childhood Education*, *6*(2).

Safitri, N. F., Astini, B. N., Sriwarthini, N. L. P. N., & Rachmayani, I. (2023). Efektivitas Penerapan Teknik Ecoprint Untuk Mengembangkan Kreativitas Anak Usia 5-6 Tahun. *Jurnal Ilmiah Profesi Pendidikan*, *8*(1), 403–409. https://doi.org/10.29303/jipp.v8i1.1181

Sugiyono. (2015). *Metode Penelitian Kombinasi (Mix Methods)*. Alfabeta.

Susanti, S. M., Henny, & Marwah. (2021). Inovasi Pembelajaran Anak Usia Dini Berbasis Kearifan Lokal Melalui Kegiatan Eco print Di Masa Pandemic Covid-19. *Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini*, 5(2), 1987–1996. https://doi.org/10.31004/obsesi.v5i2.594

Widayati, J. R., Safrina, R., & Supriyati, Y. (2021). Analisis Pengembangan Literasi Sains Anak Usia Dini melalui Alat Permainan Edukatif. *Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini*, *5*(1), 654. https://doi.org/10.31004/obsesi.v5i1.692

Zahro, I. F., Atika, A. R., & Westhisi, S. M. (2019). Strategi Pembelajaran Literasi Sains Untuk Anak Usia Dini. *Jurnal Ilmiah Potensia*, *4*(2), 121–130. https://doi.org/10.33369/jip.4.2.121