



## Implementation of Project Based Learning Method in Developing Cognitive Abilities of Children Aged 5-6 Years Through Loose Parts Media

Maya Putri Aulia<sup>1</sup>, Sudarti<sup>2</sup>, Firdaus Zar'in<sup>3</sup>

<sup>1,2,3</sup> Universitas Muhammadiyah Pontianak, Indonesia

Corresponding Author :  [putrimaya2205@gmail.com](mailto:putrimaya2205@gmail.com)

### ABSTRACT

This study aims to explore the implementation of Project Based learning (PBL) method in developing cognitive abilities of children aged 5-6 years through loose parts media. The research used a descriptive qualitative approach with a focus on observing the implementation of learning activities at 'Aisyiyah Bustanul Athfal 3 Kindergarten, Southeast Pontianak. Data were obtained through observation, interviews, and document analysis. The results showed that the PBL method applied through loose parts media was effective in developing cognitive abilities of children aged 5-6 years. Careful planning, the active role of teachers in supporting activities, and the use of interesting media are important factors in the successful implementation of this method. In addition, the results also showed that children showed progress in problem solving, logical thinking and symbolic thinking through active participation in learning activities. The findings make an important contribution to the understanding of the use of the PBL method and loose parts media in the context of early childhood education and provide practical guidance for educators to improve the quality of learning in early childhood education institutions.

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## INTRODUCTION

Early childhood is a child who is in need of educational efforts to achieve the optimization of all aspects of development, both physical and psychological development which includes the development of religious and moral values, cognitive, language, motoric, art and social emotional. Law Number 20 of 2003 concerning the National Education System article 1 paragraph 14 states that "Early childhood education is a coaching effort aimed at children from birth to six years of age which is carried out through providing educational stimuli to help physical and spiritual growth and development so that children have readiness to enter further education".

PAUD institutions have a function as educational institutions that not only teach how to count and read, but also how to interact with schoolmates, adapt to new environments, and follow teaching and learning activities at school. Childhood is the right time to start providing various stimuli so that children can develop optimally. What a person learns early in life will have an impact on future life. Early childhood education is a central and fundamental and strategic institution. (Ardiana, 2022) states that Early childhood is a critical age in the stages of spiritual development, physical motor, cognitive, language, social emotional and art. To develop these aspects, a teacher's strategy is needed in developing the learning process in PAUD institutions.

Early childhood education is a form of education that is non-formal, informal, and formal. Where in early childhood education emphasizes the starting point in directing children to grow and develop. There are 6 aspects of development regulated in the Regulation of the Minister of Education and Culture of the Republic of Indonesia Number 137 of 2014 concerning "National Standards for Early Childhood Education" namely religious and moral values, physical-motor, cognitive, language, social-emotional, and art. In each aspect there are indicators that make it easier for educators to develop activities that are interesting for children. Each aspect has components that must be developed in accordance with existing indicators. One of the aspects above is the aspect of cognitive development.

Aspects of cognitive development are divided into 3, namely: First, solving problems in learning, namely, recognizing simple concepts in everyday life, recognizing based on function, knowing the concepts of many and few, using objects as symbolic games, creating something according to ideas from themselves related to all forms of problem solving, symptoms of curiosity in observing objects, recognizing the pattern of an activity and realizing the importance of time, understanding position / position in the family, space, and social environment. Second, logical thinking, namely classifying objects based on function, shape, color and size, recognizing cause-and-effect effects related to themselves, classifying similar objects, or the same or in pairs with 2 variations, recognizing patterns (for example, AB-AB and ABC-ABC) and repeating them, and sorting objects based on 4 variations in both size and color. Third, symbolic thinking, namely recognizing the concept of number, recognizing various aspects of children walking holistically, counting objects from one to ten, this does not happen separately and is influenced by various internal and external factors.

Cognitive development skills aim to develop children's thinking skills, so that they can process their learning gains, can find various ways of solving

problems, help children to develop their mathematical logic skills and knowledge of space and time, and have the ability to sort, classify and prepare for the development of meticulous thinking skills. Piaget's cognitive theory in which children's knowledge construction comes from what they see and understand through habituation in their environment. Cognitive ability can be interpreted as the ability to know something, meaning that understanding shows the ability to capture the nature, meaning, or information about something and have a clear picture of it, cognitive development itself refers to the ability a child has to understand something.

During the teaching and learning process, the role of the teacher as a class manager is a very important factor. Teacher activity and creativity in delivering subject matter is one aspect that determines the success and smoothness of teaching and learning activities. Teaching variations that can be done by teachers in addition to the use of teaching media are also in the use of teaching models and methods (Lubis & Ritonga, 2023).

Methods are closely related to developmental dimensions, some learning methods are able to develop cognitive, creativity, language, social, and emotional development dimensions. Keep in mind that children in general are always active, have a strong curiosity, love to experiment and test, are able to express themselves creatively, have imagination, and love to talk. But sometimes children also still find it difficult in terms of solving daily life problems and thinking logically. Given this, teachers need to think about what methods are in accordance with the needs of children, especially to develop children's cognitive. The method that will be used in learning needs to be packaged in such a way that it can develop children's cognitive by increasing curiosity and developing children's imagination.

One of the suitable learning methods to develop children's cognitive is the Project Based Learning method or project-based learning method. The project-based learning method is one way of teaching by providing opportunities for children to solve problems in everyday life both individually and in groups. The project method is important to be applied in early childhood because it is related to real daily life so that children learn from their own experiences. This is proven to be more meaningful than the usual method. According to (Amelia & Aisya, 2021) that Children can learn to organize themselves to work with friends in solving problems and can have an impact on the development of work ethic.

In addition, learning will also be fun when using real object media such as loose parts media which is a media based on natural materials, plastics, metals, glass, and ceramics that are easily available in the surrounding environment

such as rocks, wood, twigs, seeds, dry leaves, banana fronds, bamboo, used clothes buttons, used bottle caps, and kitchen utensils where safety has been considered for children. With the help of this loose parts media, children can recognize the concept of counting, problem solving, classifying objects based on characteristics, shape, and color.

The Project Based Learning method or project learning method has been researched by (Maulidiah et al., 2016) entitled The results of the study confirmed that Project Based Learning learning can improve cognitive development in recognizing differences based on color, shape, size, and each aspect has increased and is categorized as high.

Then the concept of loose parts media has also been studied by (Valentina Dewi et al., 2023) in her journal entitled "The Effect of Using Loose Parts Media on Early Childhood Cognitive Development". Based on the results of the analysis obtained by researchers in this study, the level of cognitive abilities of children using loose parts media is much higher when compared to children who are given conventional or traditional learning, namely learning models that only focus on lecture learning methods.

Therefore, with previous research, researchers are interested in conducting further research on the Project Based Learning method in developing children's cognitive abilities through loose parts media. The differences between this research and previous research are the research methods used, the research subject and object of research, and the references used.

Based on the results of preliminary observations at 'Aisyiyah Bustanul Athfal 3 Kindergarten, Southeast Pontianak has already implemented the Project Based Learning method or project learning method in group B1 consisting of children aged 5-6 years. The implementation of this project method aims to improve all aspects of development, namely religious and moral values, physical-motor, cognitive, language, social-emotional, and art. However, the focus in this study is the aspect of cognitive development. Based on the results of interviews with one of the group B1 teachers, the activities carried out to develop cognitive abilities are introducing the concept of problem solving in everyday life to children, for example frying eggs, decorating cakes, and gardening. Then the implementation of this method is carried out by using a lot of media including loose parts media or removable media that are easy to carry and move such as natural materials (sand, leaves, twigs), plastic materials (bottle caps, straws, plastic bottles), and metal materials (kitchen or cooking tools). With these activities, researchers will further analyze the implementation of the Project Based Learning method in developing cognitive abilities of children aged 5-6 years through loose parts media.

## RESEARCH METHODE

This type of research is descriptive qualitative research, which is research that aims to reveal a problem or situation or event. This is in accordance with the definition of qualitative research, which is a research procedure that produces descriptive data in the form of written or spoken words from people and observed behavior. Descriptive research is research carried out with the important objective of describing or describing a condition objectively (Lubis, 2024; Lubis & Ritonga, 2023). The descriptive method is used to get an overview or description of the implementation of the Project Based Learning method in developing cognitive abilities of children aged 5-6 years through loose parts media. Then in this study researchers tried to obtain data in accordance with the circumstances, realities, and phenomena investigated so that the data that had been obtained would be described rationally and objectively in accordance with the reality in the field.

## RESULT AND DISCUSSION

### Research results

This study investigated the use of Project Based Learning method in developing children's cognitive abilities through loose parts media. On the first day, activities involved decorating a picture of the Red and White Flag with materials such as tree twigs, dry leaves and beads. Careful preparation included making lesson plans, preparing the classroom without tables and chairs, and dividing tasks to prepare the materials and tools needed. The research shows the teacher's role in preparing learning media and ensuring the implementation of activities in line with the child's developmental goals.

On the second day, activities focused on counting and attaching the loose parts media to the picture of the Pancasila symbol. Preparation and implementation of activities were similar to the first day, with an emphasis on ensuring children remain orderly and can share media fairly. Evaluation is carried out to ensure children understand the activities and are able to do the project well.

On the third day, free bread decorating was the main focus. The preparation and implementation of activities remain structured, with an emphasis on group activities and the use of materials that appeal to children. Evaluation is done to ensure that children can complete the project well and understand the learning objectives.

In general, the implementation of Project Based Learning method with loose parts media requires careful planning and active role of the teacher in guiding the children during the activity. Evaluation of the completed projects is

also important to ensure children understand the concepts and achieve the cognitive learning objectives.

The implementation of the Project Based Learning (PBL) method involves a number of careful planning steps. On the first day, for example, preparation includes making lesson plans, preparing the classroom, and preparing materials, including loose parts media such as tree branches, dry leaves, and buttons. After that, the teacher and students sat together to do the activity of decorating the picture of the Red and White Flag on art paper. On the second day, the PBL activity focused on counting and pasting the loose parts media on the picture of the Pancasila symbol, with similar preparation and planning steps.

During the implementation of activities, teachers ensure that children can participate well, including ensuring they understand the rules of the game and remain orderly. These steps aim to optimize children's learning outcomes, including their cognitive development. During the learning process, teachers also supervise the children to evaluate their progress and provide guidance if needed.

Activities are conducted in a structured setting, where children are given time to play and rest between learning sessions. These breaks become important moments for children to interact socially and release energy. At the end of each session, an evaluation is conducted to evaluate the children's understanding of the material taught and to provide praise and positive feedback to them.

The use of loose parts media in PBL is one of the effective strategies in developing children's cognitive abilities. This media provides opportunities for children to explore and be creative, which in turn can improve their understanding of abstract concepts such as the symbols of Pancasila. Thus, PBL with the use of loose parts media can be considered as a learning approach that is based on experience and pays attention to the individual needs of each child.

The observation results in group B1 research highlighted the assessment of the project-based learning method in promoting children's cognitive abilities through loose parts media. Mrs. U and Mrs. W used anecdotal notes and observation checklist sheets to collect data through direct observation of children's attitudes and behaviors, including their cognitive abilities. Evaluation is done through question and answer and the use of observation sheets that pay attention to developmental aspects, especially children's ability to solve problems, independence, courage, and understanding of loose parts media and counting skills. Assessment is done with three categories: Early Development (AP), Developing (B), and Proficient (C), adjusted to the level of children's

independence in doing the task. In addition, praise and rewards are given as a direct assessment of children who show achievement. This evaluation process reflects an approach that fits the criteria for evaluating early childhood learning, where teachers gather information through direct observation during activities. The research findings also highlight the careful planning of the project-based learning method carried out by Mrs U and Mrs W, including the determination of the theme, preparation of learning media and classroom organization. They also encouraged children's participation in sharing personal experiences and relating them to the topic of the project.

### **Discussion**

The findings that researchers can get based on observations and interviews about planning the implementation of project-based learning methods used by Mrs. U and Mrs. W in group B1 have been designed in the form of lesson plans, starting from determining the theme, preparing learning media, and arranging the class. Then the teacher conditions the children to be ready to listen to the teacher in explaining the purpose and theme of the project activities that will be delivered. Teachers encourage and encourage children to share personal experiences about the Red and White Flag, recognize the Pancasila symbol, and decorate bread and compile it into a project topic. Basically, the planning designed by the teacher is very influential for the growth and development of children in the character of independence, because in choosing activities that will be given to children, teachers cannot be arbitrary. Teachers must be smart and creative in choosing activities, which will not make children feel bored, but on the contrary, children will feel comfortable and happy when doing teaching and learning activities in the classroom. This agrees previous result The role of teachers in planning is that teachers need to plan children's needs for their activities, attention, stimulation, and success through balance and integration in the classroom and through the implementation of planned activity designs (Firman & Anhusadar, 2022).

In planning, teachers must also prepare learning media that are unique and have many colors so that they can attract children's attention and children will definitely be happy during the activity process. Agree with Krassadaki who states that "the tools and materials chosen should be flexible and can be used everywhere with the equipment available around us". Strengthened by, which reveals that "media that attracts children's attention will motivate children". Based on the above views, the results of observations made by researchers are in line with the results obtained by previous experts, if the interesting tools and materials used by children increase motivation in children (Hamid, 2020).

Planning that is well organized can produce optimal activities for child development. In teaching and learning activities in group B1, especially for the implementation of the Project Based Learning method, this is because the collaboration between Mrs. U and Mrs. W is well established. Coaching planning is determining the work that must be done to achieve the specified goals. The goals that have been set are clearly located and summarized in the syllabus, annual learning implementation plan (RPPT), weekly learning implementation plan (RPPM), daily learning implementation plan (RPPH). Coaching planning is a systematic activity in an effort to achieve a certain goal and decision making for the future. This is in line with Jhon Dewey's idea (Agustina, 2018) about the concept of "learning by doing", namely "the process of obtaining learning outcomes by doing certain actions in accordance with the goal, especially the process of mastering children about how to do a job consisting of a series of behaviors to achieve goals".

Based on the results of observations, the researchers realized that Mrs. U and Mrs. W had maximized in making lesson plans and managing the classroom, especially in planning the implementation of Project Based Learning methods through loose parts media to develop children's cognitive abilities. Researchers can explain, group B1 teachers implement the Project Based Learning method with the following steps: 1) Determine the theme of the activity / Make RPPH; 2) Prepare media; 3) Explain activities to children; 4) Divide children into small groups; 5) Workmanship; 6) Evaluation of workmanship.

This is in line with Made Wena's opinion (Agustina, 2018) the steps for implementing the project method are as follows: 1) Preparation of Learning Resources, is something that must exist in every learning action. If during planning the need for learning resources has been identified at the time of implementation, just check whether learning resources are available; 2) Explaining the Project, before children work on the project the teacher must explain in detail the project plan that will be worked on. This is important to do so that when working on the project, children better understand the work procedures that must be done; 3) Group Division, dividing children into several work groups greatly affects the smooth running of the project. In addition, it can provide deeper insight into the experience of children when working on projects; 4) Project Work, while the children are working on the project, the teacher must supervise and provide guidance to all children.

In the core activities, researchers can see that the planning of activities made is in accordance with what is stated in the group B1 RPPH. Between planning and implementation has been running effectively. The



implementation of the Project Based Learning method through loose parts media can develop various aspects of child development, especially aspects of children's cognitive development.

This is observed by researchers during observations in the classroom for 3 meetings, where children can solve problems in project-based learning method learning activities such as decorating bread, children can classify loose parts media based on their shape such as decorating the Red and White Flag image media on paper art with loose parts media according to the pattern, and children can think symbolically by matching numbers with number symbols, namely counting the number of Pancasila symbols and then attaching loose parts media to the image media. In line with cognitive development as stated by previous result stated that one of the characteristics of children's readiness in the aspect of cognitive development is that it includes mathematics and science (Putri et al., 2021). In accordance with the scope of cognitive development aspects in the K-13 early childhood education curriculum, where these cognitive aspects include: 1) Learning and problem solving: able to solve simple problems in everyday life in a flexible and socially acceptable way and apply knowledge or experience in a new context; 2) Logical thinking: recognising differences, classifications, patterns, taking initiative, planning, and recognising cause and effect; 3) Symbolic thinking: recognising, naming, and using number symbols 1-10, recognising the alphabet, and being able to represent various objects in the form of pictures.

Although not all children create perfect results and there are still children who need guidance or are not independent in working on projects, it can be concluded that the learning activities of the project-based learning method through loose parts media can develop children's cognitive abilities, especially children aged 5-6 years, namely group B children. Because children are able to work together in their groups, able to interact well, and help each other. learning occurs when children work within their zone of proximal development, something that a child cannot yet do alone, but still needs the help of friends or more competent adults. (Angga Saputra & Lalu Suryandi, 2021).

There are four stages of developmental levels according to Vygotsky's theory that are in line with this research, namely as follows: 1) First, the more dependence to others stage, which is the stage where children's performance gets a lot of help from other parties such as their peers, parents, teachers, society, experts, and others. This is where cooperative or collaborative learning models emerge in developing children's cognition constructively; 2) Second, less dependence external assistance stage, where children's performance no

longer expects too much help from other parties, but rather self assistance, more children help themselves; 3) Third, Internalisation and automatization stage, where children's performance is more internalised automatically. Awareness of the importance of self-development can arise on its own without greater coercion and direction from others. However, children at this stage have not yet reached true maturity and are still searching for self-identity in an effort to achieve mature self-capacity; 4) Fourth, De-automatization stage, where the child's performance is able to release feelings from the heart, soul, and emotions that are carried out repeatedly, back and forth, recursion (problem solving). At this stage, what is called de-automatisation comes out as the peak of real performance (Angga Saputra & Lalu Suryandi, 2021).

The small notes made by Mrs W are anecdotal notes which are daily journals that record the unique behaviour of students during the learning process. Mrs U and Mrs W made notes when the project-based learning method activities took place. This is in line with Kemdikbud (Hani, 2019) that anecdotal notes are in the form of notes describing facts, describing situations that occur, children's behaviour and speech. Then for the final assessment they use a checklist of child development which is a list of notes about something that becomes a reference to check whether something happened or not. Agree with (Hani, 2019) who reveals that checklists can be used to assess the achievement of child development. And checklists can be used by teachers to determine children's skills or developmental characteristics in order for a better plan in the next stage.

When the child evaluates by telling a story or answering correctly, usually Mrs U and Mrs W give awards or rewards to the child in the form of praise, Mrs U says "Masyaallah..your child is getting smarter". In addition to giving praise in the form of words, Mrs U usually gives a thumbs up to the child. With this evaluation, it can stimulate children's enthusiasm and can strengthen the understanding and development of children's cognitive abilities in the application of Project Based Learning methods through loose parts media.

In its implementation, the learning process must be carefully designed. If the teacher succeeds in designing an effective learning process for students, the learning objectives to be achieved can be achieved with maximum results. There are two factors found when implementing the project-based learning method through loose parts media, namely first, internal factors which this factor is contained in the child as the researchers observed during observations in group B1 the level of curiosity of the children was very high. So that when Mrs W prepared the loose parts media to carry out the project-based learning method activities, the children immediately approached Mrs W and asked

"what is this? What is it for?" immediately the classroom atmosphere could not be conducive and difficult to order. Then this internal factor can also be included as a supporting factor because of the cooperation between class teachers so that the project-based learning method activities can run smoothly and well according to its stages.

Second, external factors which are factors from outside the individual and affect teaching and learning activities as observed by researchers during observations in group B1 are very limited time and costs incurred to buy loose parts media that are not available in the school warehouse or not in the school environment. Based on the results of interviews with Mrs U to find loose parts media she collaborated with Mrs W, they looked for media in the environment around them such as twigs, dry leaves, and green leaves. As for cake ingredients, pom-poms, buttons, and beads, they buy them by joint venture.

The co-operation between teachers applied by Mrs U and Mrs W is in line with the role of educators in Law number 20 article 39 paragraph 2 outlines that educators are professionals who are tasked with planning and implementing the learning process, assessing learning outcomes, conducting guidance and training, and conducting research and community service, especially for educators in higher education (Firman & Anhusadar, 2022).

According to (Balkis Winanda et al., 2022) that in education, learning activities do not always go well according to our expectations, but there are several factors that can affect the success of the educational process For this reason, we must first know what is included in the educational component, such as supporting factors in learning and inhibiting factors in learning. As for what is meant by supporting factors are all factors that are in nature to encourage, support, launch, support, help, accelerate and the occurrence of something activity While what is meant by inhibiting factors are all types of factors that are inhibiting (making slow) or even blocking and holding back the occurrence of something activity. These factors vary greatly in their sources, which may come from the teaching staff (teachers) or may come from the students themselves.

## CONCLUSION

In its application, the learning process must be carefully designed so that learning objectives can be achieved optimally. Internal and external factors influence the success of project-based learning method through loose parts media. Internal factors include students' high level of curiosity, but can also create classroom disruptions if not handled properly. Cooperation between teachers can be a support in overcoming internal factors. While external factors,

such as limited time and cost to acquire loose parts media, require collaborative efforts between teachers and related parties to find alternative solutions. This approach is in line with the role of educators stipulated in Law number 20 article 39 paragraph 2, which emphasizes planning and implementing learning and mentoring. In the context of education, supporting and inhibiting factors must be understood and addressed effectively to improve the success of the learning process.

## REFERENCES

- Agustina, Y. (2018). *Penerapan Metode Proyek Untuk Meningkatkan Kognitif Dalam Mengenal Geometri Pada Anak Usia 5-6 Tahun di TK Aisyiyah 2 Kedaton Bandar Lampung* [UIN Raden Intan Lampung]. <http://repository.radenintan.ac.id/4482/>
- Amelia, N., & Aisyah, N. (2021). Model Pembelajaran Berbasis Proyek (Project Based Learning) Dan Penerapannya Pada Anak Usia Dini Di Tkit Al-Farabi. *BUHUTS AL-ATHFAL: Jurnal Pendidikan Dan Anak Usia Dini*, 1(2), 181-199. <https://doi.org/10.24952/alathfal.v1i2.3912>
- Angga Saputra, A. S., & Lalu Suryandi, L. S. (2021). Perkembangan Kognitif Anak Usia Dini Dalam Perspektif Vygotsky Dan Implikasinya Dalam Pembelajaran. *PELANGI: Jurnal Pemikiran Dan Penelitian Islam Anak Usia Dini*, 2(2), 198-206. <https://doi.org/10.52266/pelangi.v2i2.582>
- Ardiana, R. (2022). Strategi Guru dalam Mengembangkan Kemampuan Kognitif Anak Usia 5-6 Tahun di Taman Kanak Kanak. *Murhum: Jurnal Pendidikan Anak Usia Dini*, 3(2), 1-10. <https://doi.org/10.37985/murhum.v3i2.116>
- Balkis Winanda, M., Fikria Hasibuan, A., Ilham Maulana Batu Bara, M., Ilmu Tarbiyah Dan Keguruan, F., & Islam Negeri Sumatera Utara, U. (2022). Analisis Faktor Pendukung Dan Penghambat Pembelajaran Terhadap Siswa/I Min 1 Labuhanbatu Selatan. *Effect: Jurnal Kajian Konseling*, 1(1), 92-95.
- Firman, W., & Anhusadar, L. O. (2022). Peran Guru dalam Menstimulasi Kemampuan Kognitif Anak Usia Dini. *Kiddo: Jurnal Pendidikan Islam Anak Usia Dini*, 3(2), 28-37. <https://doi.org/10.19105/kiddo.v3i2.6721>
- Hamid, L. (2020). Tahapan Menggunting Untuk Meningkatkan Kemampuan Motorik Halus Anak Usia Dini Kelompok Usia 4-6 Tahun. *Jurnal Keislaman Dan Pendidikan*, 1(1), 1-14.
- Hani, A. A. (2019). Evaluasi Pembelajaran Pada PAUD Alya. *JURNAL CARE*, 7(1).
- Lubis, Y. W. (2024). Pembentukan Karakter Unggul: Analisis Optimalisasi

- Pendidikan Melalui Organisasi Siswa Intra Madrasah (OSIM) Di MAN 2 Deli Serdang. *Bersatu: Jurnal Pendidikan Bhinneka Tunggal Ika*, 2(1), 274–282.  
<https://journal.politeknik-pratama.ac.id/index.php/bersatu/article/view/554>
- Lubis, Y. W., & Ritonga, A. A. (2023). *Mobilization School Program: Implementation of Islamic Religious Education Teacher Preparation in Elementary*. 06(01), 144–158.  
<https://doi.org/https://doi.org/10.37758/jat.v6i1.632>
- Maulidiah, D., Fadillah, & Yuniarni, D. (2016). Peningkatan Perkembangan Kognitif Melalui Pembelajaran Sains Pemula Dengan Metode Proyek di Taman Kanak-Kanak. *Jurnal Pendidikan Dan Pengajaran*, 5(6).  
<https://doi.org/http://dx.doi.org/10.26418/jppk.v5i06.15708>
- Putri, M. A., Wulandari, C., & Febriastuti, A. R. (2021). Implementasi Pendekatan Pembelajaran Steam Berbahan Loose Parts Dalam Mengembangkan Ketrampilan Abad 21 Pada Anak Usia Dini. *ABNA: Journal of Islamic Early Childhood Education*, 2(2), 118–130.
- Valentina Dewi, E. R., Hibana, H., & Ali, M. (2023). Pengaruh Penggunaan Media Loose Parts terhadap Perkembangan Kognitif Anak Usia Dini. *Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini*, 7(1), 267–282.  
<https://doi.org/10.31004/obsesi.v7i1.3451>