

## Implementation of Loose Parts Media to Improve Problem-Solving Skills of Children Aged 5–6 Years at TKK Regina Pacis Bajawa

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### ABSTRACT

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This study aims to determine the effect of using loose parts media on the problem-solving abilities of children aged 5–6 years at TKK Regina Pacis Bajawa. This research employed a pre-experimental method with a qualitative data analysis approach. The research subjects consisted of 25 children from Class B Merah. Data collection techniques were carried out through observation and documentation of learning activities to obtain a comprehensive picture of the problem-solving processes demonstrated by children during play activities. Data were analyzed through the stages of data reduction, data presentation, and conclusion drawing. The results of the analysis showed changes in children's behavior after the implementation of loose parts media, particularly in their ability to identify problems, try various solution strategies, and solve problems more independently. Children appeared more active, creative, and demonstrated persistence when facing challenges during play. Thus, the use of loose parts media has a positive effect

on improving the problem-solving abilities of children aged 5–6 years at TKK Regina Pacis Bajawa.

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### Introduction

Early childhood is known as the *golden age*, a crucial period in which physical, cognitive, social, and emotional development occurs very rapidly. During this stage, children have a high level of curiosity and learn through direct experiences obtained from their surrounding environment. Therefore, appropriate stimulation is needed through active, creative, and enjoyable learning activities so that all aspects of child development can grow optimally (Antara, 2019). In the Early Childhood Education Curriculum, as stated in the Regulation of the Minister of Education and Culture Number 137 of 2014, the cognitive aspect is one of the important components developed through play and exploration activities (Khaeriyah, 2018).

Children aged 5–6 years, according to Piaget (Santrock, 2021), are in the preoperational stage. At this stage, children begin to use symbols, images, and language to represent real objects. They also begin to understand cause-and-effect relationships and attempt to find simple solutions in daily activities. At this stage, children are expected to develop critical thinking and problem-solving skills (Yuniwanti, 2024). This process reflects the gradual growth and advancement of children's thinking abilities toward more complex and structured levels (Kuswanto & Viyantini, 2020). Problem-solving ability is one of the essential skills that must be developed in early childhood, as it is part of

the cognitive development domain. Through play, children acquire knowledge, skills, and meaningful learning experiences. Play also provides opportunities for children to learn ways to solve problems. As one of the core components of basic skill development in kindergarten curriculum, the cognitive aspect plays a vital role in enhancing children's thinking abilities, helping them understand logic and discover various ways to solve problems (Utami & Pusari, 2018).

Based on preliminary observations conducted at TKK Regina Pacis Bajawa, it was found that children's problem-solving abilities had not developed optimally. This was evident from children's difficulties in identifying problems, implementing appropriate problem-solving strategies, and finding creative solutions when encountering obstacles. In addition, children showed difficulty in managing emotions when facing challenging situations and lacked initiative and independence in solving problems. These conditions indicate the need for appropriate stimulation and learning strategies to support the development of children's problem-solving abilities. The selection of loose parts media is based on its creative potential, as stated by Prameswari & Lestaringrum (2020), who emphasize that the use of loose parts can enhance children's creativity and imagination.

One solution to improve children's problem-solving abilities—such as identifying problems, applying appropriate strategies, and finding creative solutions—is the use of loose parts play. Loose parts provide opportunities for children to explore, create, and solve problems using

various objects that can be arranged, assembled, or modified according to their creativity. Therefore, this strategy is expected to stimulate critical thinking, creativity, initiative, and independence in solving problems more effectively.

Previous research related to loose parts media in improving problem-solving abilities was conducted by Safitri & Lestarinigrum (2021), showing that loose parts can enhance children's creativity and problem-solving skills. Therefore, it is recommended that early childhood educators utilize loose parts derived from surrounding environmental materials as learning media to stimulate children's creativity.

Similarly, a study by Aulia (2024) found that the implementation of the Problem-Based Learning (PBL) method through loose parts media is effective in developing the cognitive abilities of children aged 5–6 years. The success of this method is influenced by proper lesson planning, active teacher involvement, and the use of engaging and varied learning media. Additionally, children showed improvements in problem-solving, logical thinking, and symbolic thinking through direct involvement in learning activities.

Based on the problems and explanations above regarding loose parts, it is considered important to implement this media. Therefore, it is essential for researchers to conduct a study on the use of loose parts media to improve children's problem-solving abilities at TKK Regina Pacis Bajawa. This research not only aims to empirically prove the

effectiveness of the media in the studied context but also to contribute to the development of innovative, creative, and developmentally appropriate learning strategies for early childhood education. Thus, the findings are expected to provide effective solutions for optimizing children's problem-solving abilities and serve as a reference for teachers in designing more meaningful and enjoyable learning experiences.

### Methods

This study employed a quantitative experimental method with a pre-experimental approach, specifically the One-Group Pretest–Posttest Design (Sarwono & Handayani, 2021). This approach was selected because it is capable of describing in depth the process of developing children's problem-solving abilities through the use of loose parts media. The focus of the study lies in behavioral changes and the development of children's abilities, including identifying problems, planning solutions, trying various alternatives, solving problems according to goals, and reflecting on both the process and outcomes of learning activities.

The research was conducted at TKK Regina Pacis Bajawa, located in Trikora Village. The selection of this site was based on the consideration that the institution has early childhood learners who match the focus of the study and is open to the implementation of loose parts media in learning activities. The research took place in November 2025 according to an agreed schedule, ensuring that the data obtained represent natural learning activities occurring within the school

environment.

The research subjects were 25 children aged 5–6 years (Group B). These children were the primary focus in observing the development of problem-solving abilities. In this study, the children also acted as the main informants, as all data were obtained through observations of their activities and behaviors during the learning process using loose parts media.

Data collection was carried out through observation and documentation. Observation was conducted directly to obtain a real picture of the learning process and the development of children's problem-solving abilities. Meanwhile, documentation involved collecting supporting data such as photographs of activities, observation notes, and relevant learning documents. This documentation technique served to strengthen the observational data, ensuring that the analysis has a clear empirical basis and can be accounted for.

Data analysis was conducted qualitatively through three main stages: data reduction, data presentation, and conclusion drawing. In the data reduction stage, the researcher selected and focused on data relevant to the research objectives, particularly those related to children's ability to identify problems, plan strategies, try various alternative solutions, and solve problems. Irrelevant data were excluded, while selected data were grouped into categories such as children's initial responses, exploration processes, strategies used, and results or

solutions achieved. This stage aimed to make the data more organized and facilitate the identification of patterns in the development of children's problem-solving abilities.

In the data presentation stage, the results of the analysis were organized into structured descriptive narratives, making them easier to understand and further analyze. The presentation described the learning process sequentially and illustrated changes in children's behavior during activities. In addition, the presentation could be complemented with summary tables or development matrices to clarify relationships between data and facilitate comparisons between conditions before and after the implementation of loose parts media.

The final stage was conclusion drawing, which involved interpreting the presented data to identify meanings, patterns, and relationships among findings. At this stage, the researcher analyzed improvements in children's problem-solving abilities after the implementation of loose parts media, such as more active initial responses, increased confidence in trying various alternative solutions, development of strategies used, and the ability to solve problems more independently. The conclusions were verified by reviewing field data and matching observational results with documentation to ensure the consistency and validity of the findings.

The research instrument used was an observation sheet covering five indicators of problem-solving ability: the ability to identify problems, plan solutions, try various alternative solutions, solve

problems according to goals, and reflect on the process and outcomes of activities. Assessment was conducted using developmental categories: Not Yet Developed (BB), Beginning to Develop (MB), Developing as Expected (BSH), and Very Well Developed (BSB). Each category reflects the level of independence and ability of children in completing tasks, ranging from being unable to perform tasks to being able to complete them independently without assistance.

The assessment score was calculated by determining the maximum score based on the number of indicators multiplied by the highest score. With five indicators and a maximum score of 4 for each, the maximum total score was 20. The final score was obtained by comparing the child's score with the maximum score, then multiplying by 100. The results were then converted into developmental categories: 85–100 (Very Well Developed), 70–84 (Developing as Expected), 55–69 (Beginning to Develop), and 0–54 (Not Yet Developed).

The assessment in this study refers to the principles of early childhood developmental assessment, which emphasize observation of processes, the level of assistance provided, and individual child development. This principle aligns with McAfee et al. (2011), who state that early childhood assessment should focus on developmental processes and progress rather than solely on final outcomes. Furthermore, the assessment system also refers to national policies from the Ministry of Education and Culture of the Republic of Indonesia, as stated in Regulation Numbers 137 and 146 of 2014, which emphasize

that early childhood assessment should be reported in developmental categories. Theoretically, the use of these categories is also consistent with Jean Piaget's theory of cognitive development, which states that children's thinking abilities develop gradually according to their level of maturity and interaction with the environment. Thus, the assessment used in this study not only provides an overview of children's achievements but also serves as a basis for designing learning stimulation appropriate to their developmental stage.

### **Result and Discussions**

Before the implementation of the study, the researcher first conducted a preliminary observation to examine the initial condition of children's cognitive development at TKK Regina Pacis Bajawa. This observation was carried out by filling in a cognitive development observation sheet without using loose parts media. The observation focused on regular learning activities conducted by the teacher, particularly in problem-solving activities.

The assessment was based on predetermined problem-solving indicators in the research instrument, including the ability to identify problems, find solutions, try various alternative solutions, complete tasks according to goals, and reflect on the process and outcomes. The results of this initial observation were used as a baseline to compare improvements in children's problem-solving abilities after the implementation of loose parts media in learning activities.

**Table 1. Initial Observation Indicators of Children’s Cognitive Development**

No	Child	Assessment Indicators					Total Score	Final Score	Development Category
		I1	I2	I3	I4	I5			
		1	M	1	2	1			
2	A	1	3	3	2	2	11	55	BB
3	M	2	2	2	2	1	9	45	BB
4	A	3	3	3	3	2	14	70	BSH
5	K	2	2	2	2	1	9	45	BB
6	A	3	3	2	2	2	12	60	MB
7	E	2	2	3	2	2	11	55	BB
8	J	3	4	3	2	4	16	80	BSH
9	G	4	3	2	2	3	14	70	BSH
10	D	3	3	3	4	3	16	80	BSH
11	C	2	2	2	3	1	11	55	BB
12	M	3	2	2	3	2	12	60	MB
13	T	3	2	3	2	2	12	60	MB
14	F	3	3	4	3	3	16	80	BSH
15	A	4	3	2	3	2	14	70	BSH
16	E	3	4	3	4	3	17	85	BSB
17	K	3	3	3	2	3	14	70	BSH
18	T	2	2	3	2	2	11	55	BB
19	F	3	3	3	4	3	16	80	BSH

20	F	2	2	2	2	3	11	55	BB
21	C	3	3	4	4	3	17	85	BSH
22	S	2	2	2	3	3	12	60	MB
23	A	3	3	3	4	2	15	75	BSH
24	A	2	3	2	3	2	12	60	MB
25	C	2	2	2	3	2	11	55	BB

### Indicator Description

- I1: Child is able to identify problems
- I2: Child is able to plan solutions
- I3: Child tries various alternative solutions
- I4: Child solves problems according to goals
- I5: Child reflects on the process and results

Based on the results of the initial observation conducted on 25 children using five indicators, with a maximum score of 4 for each indicator, the maximum possible score for each child is 20.

The calculation of the final score was carried out using the following formula:

$$\text{Final Score} = (\text{Score Obtained} / \text{Maximum Score}) \times 100$$

From the calculation results, the total overall score obtained was 1,600.

This value was then used to calculate the class average:

$$\text{Class Average} = 64$$

Thus, the average score of children's problem-solving ability at the initial observation stage was 64, which falls into the category of Beginning to Develop (MB). This result indicates that, in general,

children's problem-solving abilities were not yet optimal and required further intervention through more varied and structured learning activities.

### **Implementation Results Using Loose Parts Media**

The results of observations during learning activities using loose parts media to improve children's problem-solving abilities showed progress across several indicators:

#### **1. Identifying Problems**

Children began to show improvement in identifying problems during loose parts play. Out of 25 children, 5 children were still unable to identify problems (BB category), indicating that they still needed guidance from the teacher. Some children were in the MB category, meaning they had begun to identify problems and plan solutions but still required some assistance. Meanwhile, children in the BSH category were able to identify problems and independently plan solutions.



#### **2. Planning Solutions**

The findings showed that children were able to plan solutions using loose parts. Many children were actively involved in constructing objects such as houses using loose parts. Their enthusiasm during the

activity indicated that learning became more engaging and enjoyable, which positively influenced their problem-solving development.



### 3. Trying Various Alternative Solutions

Children demonstrated the ability to try different alternative solutions during the activity. Some children were still in the developing stage and required minimal guidance, while others were able to independently explore multiple solution strategies. However, a few children still showed hesitation and needed teacher support.



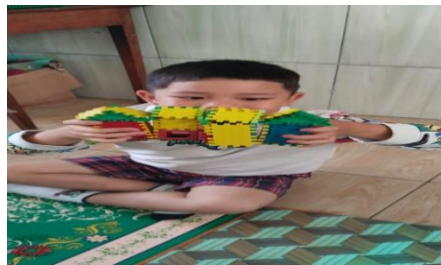
### 4. Solving Problems According to Goals

Children showed progress in completing tasks according to their planned goals. Some children (BSB category) were able to independently construct objects such as houses using loose parts according to their plans. Others (BSH category) could complete tasks with minimal assistance, while children in the MB category still required guidance.



## 5. Reflecting on Process and Results

Children began to develop reflective abilities. Some children (BB category) were still unable to explain their activities and required full guidance. However, other children were able to describe their process, explain difficulties encountered, and express their feelings about their work (e.g., happiness, pride, or desire to improve).



**Table 2. Observation Indicators of Children’s Problem-Solving Development Through Loose Parts Media**

No	Child	Assessment Indicators					Total Score	Final Score	Development Category
		I1	I2	I3	I4	I5			
1	M	2	2	3	3	2	12	60	MB
2	A	2	3	3	2	2	12	60	MB
3	M	3	3	4	3	3	16	80	BSH

4	A	4	3	3	4	3	17	85	BSB
5	K	2	3	3	3	2	13	65	MB
6	A	3	3	3	4	3	16	80	BSH
7	E	4	4	3	3	4	18	90	BSB
8	J	4	4	4	3	4	19	95	BSB
9	G	4	4	4	3	2	17	85	BSB
10	D	4	4	3	4	2	17	85	BSB
11	C	4	3	4	3	3	17	85	BSB
12	M	3	3	3	3	2	14	70	BSH
13	T	3	3	3	3	2	14	70	BSH
14	F	3	3	4	3	3	16	80	BSH
15	A	4	4	3	3	4	18	90	BSB
16	E	4	4	3	3	4	18	90	BSB
17	K	3	3	3	3	3	15	75	BSH
18	T	2	2	3	2	3	12	60	MB
19	F	4	4	4	4	3	19	95	BSB
20	F	3	3	3	3	3	18	90	BSB
21	C	3	4	3	3	3	16	80	BSH
22	S	2	3	3	3	3	14	70	BSH
23	A	4	3	4	3	3	17	85	BSB
24	A	2	2	3	3	2	12	60	MB
25	C	2	3	3	3	2	13	65	MB

### Indicator Description

- I1: Ability to identify problems in loose parts activities

- I2: Ability to plan solutions using loose parts
- I3: Ability to try various alternative solutions
- I4: Ability to solve problems according to goals
- I5: Ability to reflect on process and results

### **Analysis of Post-Observation Results**

Based on the observation results conducted on 25 children in Group B at TKK Regina Pacis Bajawa, it can be concluded that the implementation of loose parts media effectively improved children's problem-solving abilities. This improvement is evident from the shift in developmental categories. In the initial observation, most children were in the Beginning to Develop (MB) category, whereas after the implementation, many children progressed into the Developing as Expected (BSH) and Very Well Developed (BSB) categories.

Children showed significant improvement across all five indicators of problem-solving ability:

- Children became more capable of identifying problems independently.
- Children were able to plan and implement solution strategies.
- Children demonstrated flexibility in trying various alternative solutions.
- Children were able to complete tasks according to intended goals.
- Children began to reflect on their learning process and outcomes.

The findings also indicate that children became more active,

confident, and engaged during learning activities. The use of loose parts media provided opportunities for exploration, experimentation, and creative expression, which contributed significantly to the development of higher-order thinking skills.

Thus, it can be concluded that loose parts media not only supports cognitive development but also effectively stimulates critical thinking, creativity, and reflective thinking in early childhood. Consistent implementation of this media, accompanied by appropriate teacher guidance, can help children achieve optimal development in problem-solving abilities.

## DISCUSSION

Based on the research findings, the implementation of loose parts media has proven to have a positive effect on the cognitive development of children aged 5–6 years at TKK Regina Pacis Bajawa. This improvement is reflected in the achievement of problem-solving ability indicators, including the ability to identify problems, find solutions, try various alternative solutions, complete tasks according to goals, and reflect on both the process and outcomes.

These findings are consistent with the loose parts theory developed by Nicholson and further reinforced in contemporary early childhood education studies, which states that learning environments providing open-ended and unstructured materials can encourage children to think critically, creatively, and actively engage in problem-solving. Loose parts media gives children the freedom to determine the function and

use of materials, thereby encouraging them to identify problems that arise during play, such as structural failure or mismatched forms.

In addition, loose parts materials are easily obtained from the surrounding environment and do not require significant costs. This aligns with the findings of Komara & Rohmalina (2023), which emphasize that open-ended materials are widely available in nature and provide opportunities for children to express creativity freely. Through such materials, children are given autonomy to experiment and explore, which plays a crucial role in developing their cognitive abilities.

Furthermore, the results of this study are in line with contemporary play-based learning theory proposed by Golinkoff et al. (2020), which highlights that meaningful play-based learning can enhance higher-order cognitive skills, including problem-solving abilities. Through loose parts activities, children actively seek solutions, test various alternatives, and evaluate the outcomes of their actions, making the learning process more meaningful and in-depth.

The improvement in children's ability to try various alternative solutions indicates that loose parts media supports the development of flexible thinking. At the early childhood stage, this type of thinking is highly dependent on concrete experiences. In loose parts activities, children are faced with open-ended situations that do not have a single correct answer, encouraging them to explore multiple ways of solving problems, such as changing materials, rearranging structures, or combining different elements. This process helps children understand

that one problem can have multiple solutions.

This finding is also supported by Vygotsky's theory, as elaborated by Fleer (2021), which emphasizes that children's cognitive development can be accelerated through social interaction and active exploration in play contexts. In loose parts activities, children not only explore independently but also interact with peers and teachers. Teachers play a role in providing scaffolding through guiding questions, simple directions, and verbal encouragement without dictating outcomes. This support helps children develop flexible thinking while maintaining autonomy in decision-making.

Moreover, children's ability to complete tasks according to planned goals reflects the development of planning skills and self-regulation. In loose parts activities, children are first encouraged to plan what they want to create, such as determining the form or function of their construction. This planning stage helps children set simple goals and think about the steps needed to achieve them. During implementation, children actively arrange, combine, and modify materials according to their plans. When encountering challenges, they learn to adjust strategies, control their actions, and remain focused on their goals.

This process aligns with the HighScope theory (Hohmann & Weikart, 2019), which emphasizes the *plan-do-review* cycle in early childhood learning. This cycle supports the development of planning skills, self-control, and responsibility for one's actions. Thus, loose parts media effectively facilitates structured yet flexible learning experiences

that enhance self-regulation in children.

The indicator of reflecting on process and outcomes shows that children begin to develop early metacognitive awareness through loose parts activities. Children are actively involved in all stages of learning, from planning and execution to evaluation. They are given the freedom to choose materials, determine forms, and decide how to construct their work, making the learning experience cognitively engaging.

This finding is in line with Whitebread & Cárdenas (2011), who argue that reflective abilities in early childhood can develop through play experiences that encourage children to think about what they have done and why certain outcomes occur. When children are able to explain their process, describe difficulties, and express their reasoning, they begin to understand the relationship between actions and results. This indicates the emergence of early metacognitive skills.

Overall, the improvement in children's problem-solving abilities after the implementation of loose parts media demonstrates that this approach is effective in fostering critical thinking, creativity, and reflective thinking. Loose parts media not only serves as a play tool but also as an effective learning medium that creates a rich, exploratory, and meaningful learning environment. Therefore, it can be concluded that the use of loose parts media significantly contributes to optimizing the cognitive development of children aged 5–6 years, particularly in enhancing their problem-solving abilities.

### Conclusion

Based on the results and discussion, it can be concluded that the implementation of loose parts media has a positive and significant effect on improving the problem-solving abilities of children aged 5–6 years at TKK Regina Pacis Bajawa. This improvement is evident in various indicators, including the ability to identify problems, plan solutions, try different alternative strategies, complete tasks according to intended goals, and reflect on both the process and the outcomes of activities. The findings show that children experience a developmental shift from the *Beginning to Develop (MB)* category to *Developing as Expected (BSH)* and *Very Well Developed (BSB)* after the implementation of loose parts media. In addition, children become more active, creative, confident, and independent in engaging with learning activities.

Thus, loose parts media can be considered an effective learning approach in early childhood education, as it provides opportunities for exploration, experimentation, and meaningful learning experiences. This approach not only enhances children's problem-solving abilities but also supports the development of critical thinking, creativity, and early metacognitive skills. Therefore, it is recommended that early childhood educators utilize loose parts media as an innovative and engaging learning strategy to optimize children's cognitive development, particularly in fostering problem-solving abilities. Future research is also encouraged to explore the application of loose parts media in different contexts and developmental aspects to further strengthen its effectiveness.

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