

### ANALYSIS OF MATHEMATICAL LOGIC INTELLIGENCE OF CHILDREN AGED 4-5 YEARS AT KB SCHOLAR BAPANGAN IN TERMS OF THE APPLICATION OF OUTING CLASS LEARNING METHODS

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#### Abstract

This study focuses on an in-depth exploration of the influence of the "Outing Class" learning method on the development of logical mathematical intelligence in children aged 4-5 years at KB Cendekia Bapangan. This research uses a qualitative descriptive approach with case studies as the method, and data is collected through participatory observation, interviews, and document analysis. The findings of this study show that the Outing Class method is very effective in enriching children's logical mathematical intelligence. Teachers use a variety of practical activities, such as planting, to teach the concept of causation and the basics of mathematics. Although there are obstacles such as lack of discipline of children during outdoor activities, teachers manage to overcome this with the right approach. In addition, the annual program has been designed to ensure the long-term sustainability of Outing Class benefits. Thus, the Outing Class method is proven to make a positive contribution to the development of early childhood mathematical logic intelligence.

**Keywords:** Mathematical Logic, Intelligence of Children, Learning Methods

## INTRODUCTION

The early period of life, which usually refers to the beginning of a child's birth to the age of six, is often referred to as the "golden period" in child development. This stage is the most important period in stimulating or stimulating children. This is a sensitive period in which the child is more receptive to stimuli from his environment (Dyah Kumalasari, 2014). Children are ready to do various activities to understand and master their environment. Appropriate stimulation can support a child's physical and mental growth, so that children are ready to continue their education (Sutrisno et al., 2021). Therefore, it is very important to provide appropriate stimulation and in accordance with the child's stage of development to maximize the potential possessed.

In accordance with Law No. 20 of 2003, education aims to form civilized character and good as an effort to educate the nation's life. According to (Hermanto, 2020) Education is an important tool to improve the intelligence of the nation and improve the quality of the nation in general. Law No. 23 of 2003 affirms that Early Childhood Education (PAUD) is the process of fostering and developing the potential of individuals under six years old. This step is implemented through the provision of educational stimulation that aims to support the physical and mental growth and development of children, so that children have the readiness to continue to the next level of education.

Cognitive development is a crucial aspect to be developed in the process of child growth and development. This aspect is closely related to the thought process. Cognitive development is a process that occurs in the human central nervous system while thinking that makes it possible to remember, solve problems, and think logically (Suryana, 2016). Cognitive ability refers to an individual's thought process, which can encourage children to solve problems, think logically, and remember information (Basri, 2018). The development of these cognitive abilities takes place gradually and is strongly related to the physical and nervous development that occurs in the central nervous system (Suryana, 2017).

In an effort to form the basis of children's intelligence, cognitive development that needs to be emphasized is the intelligence of mathematical logic. This type of intelligence is very important to improve in early childhood. Mathematical logic intelligence is concerned with a child's ability to understand mathematical concepts, identify patterns, and solve problems logically. At the age of 4-5 years, children experience a very rapid phase of development, so it is important to provide appropriate stimulation to develop children's

logical mathematical intelligence. At this age, children begin to build an understanding of numbers, patterns, sequences, and basic mathematical relationships. Children also begin to hone logical thinking skills, such as grouping objects based on certain attributes and solving simple math problems.

Mathematical logic intelligence is an intelligence that involves the thought process of doing calculations, making abstractions from concrete objects, and understanding cause-and-effect relationships. According to (Mustajab et al., 2021) Mathematical logic intelligence is the ability to calculate, measure, consider, and solve mathematical problems. At this stage, children begin to build a foundation in mathematical logic. Children learn to recognize patterns, sequences, and basic mathematical relationships. For example, children can recognize sequences of numbers, distinguish between "larger" and "smaller," and group objects based on certain attributes. As cognitive development progresses, children begin to show more advanced logical thinking skills. Children are able to use logical principles to solve math problems, recognize more complicated patterns, and understand more abstract mathematical concepts, such as fractions or geometry.

Learning methods "*Outing Class*" Become an approach that can be applied to develop logical mathematical intelligence in children aged 4-5 years. Method *Outing Class* is an approach to learning that is carried out in the open or outside the classroom (Faizal et al., 2022). The purpose of this method is to provide a learning experience that is fun, interactive, and encourages children to be more active in the learning process. Through this approach, children are expected to learn more enjoyably where learning is carried out in an interesting way and provides direct experience that can help him understand mathematical concepts better. This method involves various game activities and practical educational skills to be carried out in daily life. Some examples of activities that can be performed in the method *Outing Class* These include caring for plants in the school area, observing objects around the school, or telling stories in the school garden. In this approach, children are invited to learn through direct experience i.e. interacting with objects and situations in the outside environment, such as when visiting parks, markets, or zoos.

The purpose of this study was to study how *the Outing Class learning method* affects the intelligence of mathematical logic in children aged 4-5 years at KB Cendekia Bapangan.

## METHODS

This research applies a qualitative approach type of case study to gain a deep understanding of how children's mathematical logic intelligence grows and develops in a learning environment that uses the method *Outing Class*. A case study is a series of scientific activities carried out intensively, in detail, and in depth about a program, event, or activity, either at the level of individuals, groups of people, institutions, or organizations with the aim of gaining a deep understanding of the event (Rahardjo, 2017). The research was carried out at KB Cendekia Bapangan with its data collection techniques using participatory observation, interviews, and analysis of related documents on Wednesday, December 13, 2023.

The data collection procedure is carried out through participatory observation where researchers observe learning activities in KB Cendekia Bapangan using the *Outing Class* learning method. Intensive observation is carried out to gain a comprehensive understanding of the interaction between children, teachers, and the learning environment. Interviews were conducted with teachers involved in the application of *Outing Class* learning methods by focusing on teachers' understanding of mathematical logic intelligence in children aged 4-5 years and teachers' experiences in applying these learning methods. Document analysis, namely researchers will collect and analyze documents related to learning programs at KB Cendekia Bapangan, including curriculum, lesson plans, and records of learning activities.

The validity of the data in this study was obtained through the process of data triangulation. Data triangulation is a method of data verification that involves different sources, methods, and timing (Wijaya, 2018). The data triangulation method is used to verify the validity of data obtained from interview results which are then confirmed.

## RESULTS

The age of 4-5 years is the golden age to recognize, identify, and stimulate children's mathematical logic intelligence. This type of intelligence is closely related to a person's capabilities in the fields of mathematics and logic. In the context of mathematics, this includes the ability to identify numbers, perform number manipulation, and understand number patterns and formulas effectively.

**Table 1. Indicators of Children Aged 4-5 Years in accordance with the Child Development Achievement Level Standards**

| No | Age indicator 4-5 years                                                |
|----|------------------------------------------------------------------------|
| 1. | Classify objects by function, shape, color, or size                    |
| 2. | Understand the cause-and-effect phenomena associated with him          |
| 3. | Group objects into the same group or paired groups with two variations |
| 4. | Understand patterns.                                                   |
| 5. | Arrange objects based on five series of sizes or colors.               |

Based on observations, KB Cendekia Bapangan has applied learning *Outing Class* to improve the intelligence of children's mathematical logic. *Outing Class* is an efficient learning approach in advancing various aspects of child development. This method is given to children to create meaningful learning and make a deep impression on children. Through this method, children can gain new knowledge and experience, as well as learn to interact with nature and the surrounding environment directly. *Outing Class* also plays an important role in increasing children's enthusiasm for learning (Rahmawati & Nazarullail, 2020).

The results of observations also show that this *outing class* method has a positive impact on improving children's mathematical logic intelligence. At first, some children seem to have difficulty in understanding basic math concepts. However, after the *Outing Class* method was applied, there was a significant improvement in the children's ability to understand and apply the concepts. Children become more skilled at identifying numbers, manipulating numbers, and understanding number patterns. In addition, the *Outing Class* method also helps in the development of children's logical thinking skills. Children become more reliable in solving problems using the mathematical knowledge that children have. In general, the results of this observation illustrate that the application of *Outing Class* in learning can improve the intelligence of mathematical logic of children aged 4-5 years.

Based on the results of interviews conducted with teachers at KB Cendekia Bapangan, teachers explained that teachers use media as a way to introduce interesting math games or activities for early childhood. An example of an activity carried out is by using the method *Outing Class* for planting seeds of tomatoes, peppers and eggplants. Through this activity, children are taught to count the number of seeds planted, measure plants planted, group plants by type, understand the concept of more and less, and recognize plant growth patterns. *Outing Class* Not only does it provide a fun and interactive

learning experience, but it also helps in the development of a child's mathematical logic intelligence. *Outing Class* Having a unique way, which not only provides an engaging and engaging learning experience for children, but also plays an important role in helping the development of mathematical logic intelligence in children (Nabighoh et al., 2022; Tasliyah et al., 2020).

In assessing children's understanding when classifying objects, teachers do it in several ways. First, the teacher mentions a lighter question to start a discussion or activity. These questions are designed to stimulate the child's thinking and encourage the child to think critically about the topic at hand. Second, the teacher assesses how the child can answer the question. It provides insight into the child's understanding of the material and the child's ability to apply the child's knowledge in new situations. Understanding concepts can provide insight into a child's understanding of the material and a child's ability to apply a child's knowledge in new situations (Radiusman, 2020). Third, the teacher will see the child's success in classifying objects. It includes the child's ability to identify, group, and distinguish between various objects based on certain characteristics. Through *Outing Class*, teachers can assess and improve children's mathematical logic intelligence.

## DISCUSSION

In its implementation, the teacher also explained that the teacher uses the method *Outing Class* to teach students the concept of cause-and-effect symptoms. One example of the activity carried out is planting. Master explained that plants must be cared for, given food and drink in order to grow, just like humans. Through this activity, students can understand the concept of cause and effect directly. For example, if the plant is not properly cared for, then it will not grow well. Conversely, if the plant is well cared for, then it will grow well. Through the method *Outing Class*, teachers can teach the concept of cause-and-effect symptoms to students in an engaging and interactive way. Correspondingly, the results of the study (Glaze et al., 2021) suggests that children may need more explicit explanations of how to apply skills and knowledge to new contexts. For example, in math, children need to transfer addition skills between different formats using concrete materials, addition skills and knowledge, and so on.

In the interview, the teacher also explained that the teacher used the *Outing Class* method to improve the intelligence of children's mathematical logic. One way that children

do is to study plant growth. Children are taught to plant and care for plants, and then observe how much fruit those plants produce. Through this activity, children can understand basic math concepts such as counting and comparison. In addition, children also learn about the life cycle of plants, which helps children understand the concepts of time and sequence. Through *the Outing Class* method, teachers can integrate math learning into daily activities that are interesting and meaningful for children.

Evaluation of the success of activities *Outing Class* carried out on the basis of active participation of children. According to the teacher, activities *Outing Class* It can be said to be successful if children participate actively and are willing to practice what children have learned directly. This active participation includes children's involvement in discussions, cooperation in group activities, and the ability to apply the concepts children have learned to real situations. Correspondingly, (Widiasari et al., 2020) mention that the success of the activity *Outing Class* It can be measured by children's active participation in practicing what children have learned. This participation includes children's involvement in discussions, cooperation in group activities, and the ability to apply the concepts they have learned to real situations.

In the interview, the teacher revealed some of the obstacles that the teacher faced in the activity *Outing Class*. One of the main obstacles is children who run around, lack order, or cannot wait in line. This can be challenging, especially when doing outdoor activities that require discipline and cooperation from children. However, with the right approach, this challenge can be overcome and become an opportunity to improve children's discipline and cooperation (Erawati, 2018; Lukitasari, 2017). The teacher invites the children to make a "carriage" so that they can line up in an orderly manner. Through this way, children are taught to appreciate turns and learn about the concept of queuing. In addition, this activity also helps in building social skills and cooperation between children. Despite the obstacles, teachers can still take advantage of the method *Outing Class* to improve the intelligence of the child's mathematical logic.

As a follow-up to the *Outing Class activity*, the teacher explained that the teacher and the relevant school made *the outing class* planting an annual program at school. The program is designed to ensure that *Outing Class activities*, such as planting, become an integral part of the school curriculum. Interestingly, *the Outing Class* planting activity has been running for 2 years at KB Cendekia Bapangan. As the institution's commitment to the *outing class learning*

*method* and the school's belief that the outing class can make a positive contribution to the development of children's mathematical logic intelligence. Through the annual *outing class* planting program, teachers strive to ensure that the benefits of *outing classes* can be felt by students in the long run. Therefore, this method is highly recommended to be applied in the learning process at KB Cendekia Bapangan.

## CONCLUSION

The Outing Class *learning method* has a positive impact on improving the intelligence of mathematical logic in children aged 4-5 years at KB Cendekia Bapangan. Through this approach, children can learn actively and gain hands-on experience that helps children understand math concepts better. This method involves a variety of play activities and practical educational skills performed outside the classroom. Despite obstacles such as children's discipline, this method is still effective in improving children's mathematical logic intelligence. *Outing Class* is a meaningful learning approach and can make a positive contribution to the development of early childhood mathematical logic intelligence.

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