Media Application *Math Board* to Improve Children's Cognitiveness in RA UMDI TAQWA Parepare

Novita Ashari¹

¹IAIN Parepare, novitaashari@iainpare.ac.id

ABSTRACT

The purpose of this study is that researchers want to apply Math Board media to increase cognitive children aged 5-6 years. This is motivated by the lack of media to develop children's cognitive aspects at RA UMDI TAQWA Parepare. The method used in this research is qualitative with a case study approach. The subjects in this study were 13 children at RA UMDI TAQWA Lakessi Parepare. The results of this study indicate that Math Board media can be an innovative media that can develop children’s cognitive aspects, especially in addition and subtraction. Math Board media makes children able to solve problems and think logically with a satisfactory category because children actively participate and like Math Board, based on six indicators of children’s cognitive development.

Keywords: Children, Cognitive, Math Board

Article history:
Received : 20-07-2022
Revised : 15-03-2024
Accepted : 17-03-2024
Copyright (c) 2024 Ashari

I. INTRODUCTION

Early childhood is synonymous with the term the *golden age* (golden age) which is aged 0-8 years. This golden age has a lasting impact on children, so during this period children need to be given the right stimulation. In the golden age, children are at an age where it is very easy and good for them to absorb information. Providing appropriate stimulation to children will have an influence on the child’s brain growth and development. The presence of education for children at this age is intended to be an appropriate forum for developing and improving children’s abilities from birth to 8 years old (Andriawan, 2014).

Early Childhood Education (PAUD) is necessary at the level of children’s education. Educators play an important role in the process of children’s growth and development, because each child has different characters and traits. Every child has unique characteristics, so the growth and development of children is certainly different. Child growth can be seen from the child’s physical
growth and psychological development. One of the most important aspects in children's cognitive growth and development (Khasanah, 2022).

In general, cognitive development is defined as a child’s ability to think. Early childhood is an age where cognitive development is very rapid. Where children are able to remember, children’s interests, children’s language, children’s creativity, and solving problems in everyday life. At the age of 5-6 years, children's cognitive development is certainly well developed and formed. Good environment and nutrition also greatly influence children’s cognitive development. Not only that, providing appropriate stimulation by teachers and parents also has a big influence (Jarwani, 2022).

Children's cognitive development generally includes solving simple problems, carrying out logical thinking and symbolic thinking (Nurtaniawati, 2017). Cognitive development is also the most important development that must be developed optimally and precisely. Cognitive development is closely related to the brain. Where a child’s cognitive abilities are seen from a child's ability to carry out thought processes. This means that children are able to know and understand the knowledge they have acquired. Also, child development standards are adjusted to Minister of Education and Culture Regulation Number 137 (Arvianto & Widayati, 2020).

Minister of Education and Culture Regulation Number 137 concerning National PAUD Standards in the scope of cognitive development of children aged 5-6 years regarding learning and Solution to problem consisting of (1) activities that are exploratory and detailed, (2) able to solve their own problems that occur in everyday life, (3) increase insight and experience (4) able to provide ideas/ideas in solving problems. Then Think logically consists of (1) recognizing differences based on the order "more than"; "less than"; and "most / ter", (2) show and provide input in choosing a game theme, (3) develop a strategy for the activities to be carried out, (4) recognize cause and effect and problems regarding the environment, (5) group objects based on color, shape and size, (6) grouping more objects into the same group, similar or in pairs of more than two variants, (7) recognizing the ABCD-ABCD pattern,
(8) sorting objects based on size from smallest to largest or vice versa (Dwi Sari & Setiawan, 2020).

Cognitive development is closely related to mathematics. Where the concept of early childhood mathematics learning focuses on helping children in providing understanding and analysis of the child’s world. Generally, early childhood education only introduces mathematics from two broad lines, namely geometry and measurement. The aim is none other than because these two things are very important in preparing to continue to elementary school level. Mathematics learning at the formal education level is implemented starting from grade 1. Often mathematics learning in early childhood education is only mentioned as a child’s cognitive development. This cognitive development is carried out accompanied by play. This is designed by educators so that the mathematical elements are easily accepted by children. Children really enjoy playing, so this method is very age friendly. Because children find it easier to understand learning through games. One of the media used in mathematics learning to improve children’s cognitive abilities is media Math Board (Endira & Rianto, 2017).

Media Math Board created to provide new innovations in teacher learning methods with modified game principles. This means that the game can be adjusted according to the child’s wishes. Game Math Board This has the aim of arranging the numbers then adding or subtracting them and the results are at the very end. Not only counting other learning elements contained in learning Math Board namely the elements of observation, focusing, analyzing, and determining a result from addition or subtraction (Hasanah, 2020).

Math Board meaning math board. Math Board is a media designed to improve children’s cognitive abilities. Math Board can teach addition and subtraction. Math Board focuses mathematics learning on the addition and subtraction stage, then children can calculate the results using the balls in the Math Board. Math Board can also be said to be a games which is very fun and at the same time is an appropriate educational tool in learning mathematics (Emilia, 2022).

Math Board used in learning is a good step in developing children's
cognitive abilities. *Math Board* in the form of media made from waste materials which are processed into learning media. Then create it as uniquely as possible to form an addition and subtraction board.

Way of work *Math Board* almost the same as the way the teacher explains on the blackboard about addition and subtraction, but this was later developed into a medium. The aim is to make it easier for children to understand addition and subtraction through playing. Learning mathematics is fun for young children. Based on observations, children like learning mathematics. Mathematics learning activities for early childhood are of course designed so that the learning does not burden the child. Starting from game tools that are made as attractive as possible, learning methods that involve game contests. In this way, children will be interested and like mathematics (Hanifah & Alam, 2019).

Educators strongly recommend using educational game tools *Math Board* in learning mathematics, we see the many benefits of this media. This is very good not only in cognitive concepts, but also in other developments. *MediaMath Board* is only one of the innovative educational game tools, of course there are many other media. *Math Board* is a highly recommended medium for teaching mathematics to children, especially addition and subtraction (Indrawati & Farantika, 2021).

The results of research by Septiyani, et al (2018) which explains the influence of games board *games* on mathematics learning in introducing the concept of addition and subtraction to children aged 5-6 years. Based on this explanation, the researcher wants to conduct research on "Application of Media *Math Board* to Improve the Cognition of Children Aged 5-6 Years at RA UMDI TAQWA Lakessi" (Kurniawati, 2013).

In connection with the initial data obtained by researchers when making these observations, what happened at RA UMDI TAQWA Lakessi was that they still used old media to develop children’s cognitive abilities. Teachers at the kindergarten have not paid attention to innovation and learning media for children’s cognitive development. Therefore, researchers want to introduce a media called *Math Board* (Listiani & Prihatnani, 2018).

The results of initial observations carried out at RA UMDI TAQWA
Lakessi Parepare still lack media for developing cognitive aspects. Based on this explanation, the researcher wants to conduct research on Media Application Math Board Can Improve Cognition in Children Aged 5-6 Years.

II. RESEARCH METHODS

The method used is qualitative research with a case study approach. The qualitative research method is motivated by a phenomenon and then the phenomenon will be described as a whole in the social reality that occurs. A case study is an approach that does not generalize in the sense of digging deeper and in more detail about an event. The theory in which the variables used will be described according to the problem in the research. The theoretical basis in this research comes from facts found by researchers in the field. This theoretical basis then provides the benefit of providing an overview of the background to the research developed in the research discussion (Laily et al., 2019).

The techniques used in collecting data are observation, interviews and documentation. The data results in this research came from 13 teachers and children at RA UMDI TAQWA Lakessi Parepare which were carried out through observation, interviews, oral tests, and field notes. The validation and rehabilitation in this research used data triangulation techniques. This means that researchers will combine various sources but use a method. By comparing the results of observations, interviews and tests, conclusions can then be drawn to determine research achievements (Malapata & Wijayanigsih, 2019).

III. RESULTS AND DISCUSSION

In this research, it is stated that the focus of the research is on related sub-data. So that the results of this research will be adapted to the journal and then the research activities in the form of data findings will be described and analyzed. Observation results, interview results and test results are the results of this research.

In this study, the observation results obtained by the researcher came from test and non-test data. The test data was carried out at the second meeting where each child who was tested was given a test regarding addition and subtraction on the media Math Board. Meanwhile, non-test data was obtained from observations during the learning media introduction activities at the first and
second meetings. Then the researchers carried out data development with the aim of being able to find out and review students' responses in learning activities that use media *Math Board* (Mulyati & Suryani, 2023).

From the research carried out, satisfactory results were obtained. Where this can be proven from the mathematics learning process using media *Math Board* which goes well and effectively. Researchers saw a response from students who were very enthusiastic in submitting themselves to learning. The results of observations on student activities as a whole obtained a success percentage of 100%, which is included in the very good category in the learning process carried out. From the results of observations that focus on aspects of cognitive development, students are able to carry out well. This assessment is based on the results of assessing the observation aspect as good (Amreta & Safa’ah, 2021).

This research shows that the learning process applies media *Math Board* very satisfactory. This is proven by the mathematics learning process which focuses on teaching addition and subtraction which takes place well and effectively. This can be seen from the high level of student response in the learning process.

This research directly involves students who play an active role in the learning process, meaning that students have been able to provide development in their learning capacity in the form of their potential. Of course, in the learning process there are changes and improvements in the quality of students' knowledge, abilities and skills. This can be seen from the results of a teacher's expression in the following interview: (a) Does mathematics learning use media *Math Board* easy to use? Yes, it's easy. Because of the learning media *Math Board* quickly recognized and applied by students; (b) Are there any difficulties faced by teachers in using media *Math Board*? Why? Because of the media *Math Board* This is a new media in RA where new media must initially be introduced to children. The introduction and use of it takes a little time; (c) Can mathematics learning be better understood through the media? *Math Board*? Learn to use media *Math Board* It really makes it easier for students to add and subtract because it can be practiced directly. Children
who immediately went down to calculate the results using the balls on the media with our guidance; (d) Are students enthusiastic in applying learning media? Math Board? Yes, because this media attracts children’s attention through the concepts presented, so children are very curious about this media (Permana & Djatmiko, 2021).

From the results of interviews conducted by researchers with teachers, it can be seen that mathematics learning uses media Math Board make it easier between educators and students. Because children are actively involved in determining the final result of the media used. Apart from that, media Math Board It also gives children freedom about what numbers to add or subtract, so that children learn and play more freely. This proves that there has been an increase in mathematics learning which focuses on addition and subtraction in the application of media Math Board. The supporting aspects come from aspects of observation, interviews and tests carried out in classroom learning (Education et al., 2014).

From the results of oral tests and direct practice which were carried out by giving questions regarding random addition and subtraction of numbers. The average result obtained by researchers from oral tests and direct practice was 81.5, with 8 students whose KKM scores were above standard and 2 people who had appropriate KKM scores. It can be concluded that this test has a success criterion of 80%. By applying media Math Board in mathematics learning, the focus on addition and subtraction has good results. Innovation in educational game tools Math Board make the learning atmosphere more fun and creative. Students have high enthusiasm for oral tests and direct practice carried out in class. So that the meaning of the material presented can be understood by students through the media Math Board (Rekysika & Haryanto, 2019).

Table 1.1. Cognitive Development Indicators

<table>
<thead>
<tr>
<th>No</th>
<th>Indicator</th>
<th>Achievement Level</th>
<th>Behavior</th>
<th>Number of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Solution to problem</td>
<td>Shows activities that are exploratory and detailed.</td>
<td>Children can calculate numbers themselves in the media Math Board</td>
<td>Two children</td>
</tr>
<tr>
<td>2</td>
<td>Show a creative</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Students</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

According to the results of research conducted by researchers at RA UMDI TAQWA Lakessi Parepare, there are problem solving indicators, children demonstrate activities that are exploratory and detailed, where at the level of achievement the child is able to calculate numbers themselves in the media Math Board. The table above shows that there are 2 children who are able to calculate numbers themselves in the media Math Board, while there were 13 children who were able to calculate their own numbers in the media Math Board so there is an increase in 11 children being able to count their own numbers in the media Math Board without the help of educators. Learning for children is expected to present elements of exploration and inquiry, so that children are able to use all five senses.

| 2. Logical Thinking | Recognize the differences based on the order "more than", "less than", and "most". | 1. Children can count numbers 1-10  
2. Children know bigger numbers  
3. Children know which numbers are smaller | 4 children  
13 children  
13 children  
13 children |
|---------------------|---------------------------------------------------------------------------------|-----------------------------------------------------------------|--------------------|
| Recognize numbers 1-10 | 1. Children know the difference between each number  
2. Children are able to do addition in the media Math Board | 10 children  
13 children  
5 children  
13 children |
| Classify objects by color, shape, and size. | 1. Children are able to collect numbers according to color | 7 children  
13 children |
| Arrange things based on a scale from smallest to largest or vice versa. | 1. Children can distinguish the size of objects around them | 5 children  
13 children  
13 children |
in these activities. Probing activities in learning are intended to make children look for more information about new things (Rusawalsep, 2020).

The results of the research on the second indicator of problem solving, children are able to show a creative attitude in solving mathematical problems, where at the level of achievement children are able to calculate numbers that are arranged by themselves in the media. Math Board, it can be seen from the table above that there are 5 children who are able to count numbers that they arrange themselves in the media Math Board. Meanwhile, there were 13 children who were able to count numbers that were arranged by themselves in the media Math Board, so that there is an increase of 8 children able to count numbers that are compiled by themselves in the media Math Board, it can be seen in the table above that children can develop according to expectations. In relation to learning, a creative attitude is an important thing to develop from an early age. This is because a creative attitude will make children have new ideas to produce new works. Creativity is closely related to children’s cognitive development (Sopian et al., 2020).

Figure 1.1 Children are able to count numbers and make up your own numbers.

After obtaining the results in the table above, there are indicators of logical thinking ability, children recognize the differences based on the order "more than", "less than", and "most", where there are 4 children who can count numbers 1-10, and 13 children can counting numbers 1-10. 3 children know the bigger number and 13 children know the bigger number. 3 children know the smaller number and 13 children know the smaller number. So there was an increase in 9 children being able to count numbers 1-10. 10 children who experienced improvement in knowing bigger numbers. The other 10 children knew smaller numbers. So it can be seen in the table of indicators that children’s cognitive development can develop according to expectations. At the level of achievement of recognizing
differences based on the size of the meaning, the child has been able to carry out scientific thinking processes and understand the differences. The right learning method recognizes sequence differences and will be well stimulated (Mulyaningsih et al., 2020).

In the table above there are indicators of children’s logical thinking abilities, it can be seen from the level of achievement of children who are able to collect numbers according to color, shape and size, where there are 7 children who are able to collect numbers according to color, and 13 children are able to collect numbers according to color so there is an increase At 6 children are able to collect numbers according to color. The ability to classify objects according to color is intended so that children can see every color difference in the numbers. The color of the numbers is intended to make it easier for children to collect numbers based on their color (Sholihah, 2019).

In the indicator table for the ability to think logically in children, it can be seen at the achievement level of knowing numbers 1-10, where 10 children know the difference between each number and 13 children know the difference between each number, 5 children are able to do addition in the media Math Board and 13 children were able to do addition in the media Math Board, 5 children were able to make deductions in the media Math Board and 13 children were able to make deductions in the media Math Board. So there was an increase of 3 children knowing the difference between each number, 8 children were able to do addition in the media Math Board, 8 children were able to make deductions in the media Math Board. It can be seen that the child is
developing according to expectations. Recognizing numbers 1-10 is a form of symbolic thinking in early childhood in cognitive development. Recognizing numbers aims to prepare children's readiness to take learning to the next level (Sulaiman et al., 2019).

Figure 1.4 Children recognize numbers 1-10.

In the indicator table for logical thinking ability, you can see the level of achievement in arranging objects based on size from smallest to largest or vice versa. There were 5 children who could differentiate the sizes of objects around them and 13 children were able to differentiate the sizes of objects around them, so there was an increase in 8 children arranging objects based on size from smallest to largest or vice versa. Children being able to sort objects based on size from smallest to largest or vice versa is an important lesson for children for their cognitive development, children get more attention, which is developed so they can think logically in ordering objects around them. The learning process can be carried out using media *Math Board*. *Math Board* is a medium that children learn in order to make it easier for children to learn to learn something complicated or simplify something sophisticated so that learning activities become more fun, exciting and interactive so that learning can be developed (Septiyani et al., 2018).

Figure 1.5 Children sort objects based on size from smallest to largest or vice versa.

IV. CONCLUSION

Based on the results of implementation research through the media *Math Board* which researchers have carried out at RA UMDI TAQWA Lakessi, most of the children in the first indicator have been able to demonstrate activities that are exploratory and detailed, as well as proving creative behavior in solving thematic problems. Then in the second indicator, children can recognize differences based on the order "more than", "less than", and "most", classify objects based on color,
shape and size, recognize numbers 1-10, and arrange objects based on their size. smallest to largest or vice versa.

REFERENCES


Rekysika, N. S., & Haryanto, H. (2019). Media Pembelajaran Ular...
https://doi.org/10.17509/cd.v10i1.16000


https://doi.org/10.22460/ceria.v1i5.p13-22

