# The Effectiveness of BDR (Learning From Home) in Improving Mathematic Thinking Ability through Open Ended Method in Early Chilhood Education

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**Abstract**

*This study aims to improve the Mathematical Thinking Ability of early childhood Using the Open-Ended Method, at Kartika Siwi Kindergarten Pusdikpal Cimahi. as the object of research, which consists of 20 children and was divided into two groups, namely the experimental group and the control group. In the experimental class the researcher gave treatment using open-ended media, while for the control group, the researcher gave treatment using ordinary learning using children's worksheets. (LKA). The research was started by conducting pretest and posttest in both groups.The results of this study are the use of open-ended methods can develop children's ability to improve mathematical thinking skills. The steps for using the successful open-ended method are as follows: (a). preparing the media before the child enters the room, (b) explaining in advance the activities to be carried out, (c) explaining the media to be used, (d) conditioning a pleasant atmosphere and providing a variety of supporting activities, (e ) counting by showing the blocks, (f) assigning children individually to arrange the numbers on the block, (g) giving motivation to children who are not yet capable.*

**Keywords**: *Mathematical Thinking Ability; Open-Ended Method.*

**Abstrak**

*Penelitian ini bertujuan untuk meningkatkan Kemampuan Berpikir Matematis anak usia dini Menggunakan Metode Open Ended, di TK Kartika Siwi Pusdikpal Cimahi.Penelitian ini merupakan penelitian yang menggunakan metode kuasi eksperimen, dimana pada penelitian ini peneliti menggunakan populasi anak usia dini kelompok B di TK Kartika Siwi Pusdikpal sebagai objek penelitian, yang terdiri dari 20 anak dan terbagi menjadi dua kelompok yaitu kelompok eksperimen dan kelompok control. Pada kelas eksperimen peneliti memberikan treatmen dengan menggunakan media metode open ended, sedangkan untuk kelompok control peneliti memberikan treatmen dengan mmenggunakan pembelajaran biasa dengan penggunaan lembar kerja anak (LKA).penelitian diawali dengan melakukan pretest dan posttest pada kedua kelompok.Hasil dari penelitian ini adalah dengan penggunaan metode open ended dapat mengembangkan kemampuan anak dalam meningkatkan kemampuan berpikir matematis. Adapun langkah-langkah penggunaan metode open ended yang berhasil adalah sebagai berikut :(a). menyiapkan media sebelum anak masuk ruangan, (b) menjelaskan terlebih dahulu kegiatan yng akan dilakukan, (c) menjelaskan media yang akan digunakan, (d) mengkondisikan suasana yang menyenangkan dan memberi variasi kegiatan yang menunjang, (e) membilang dengan menunjukkan balok-balok, (f) menugaskan anak secara individu untuk menyusun angka yang ada di balok, (g) memberi motivasi pada anak yang belum mampu.*

***Kata Kunci:*** *Kemampuan Berpikir Matematis; Metode Open Ended.*

**INTRODUCTION**

Giving stimulus to early childhood formally in the school environment is often referred to as early childhood education. Early childhood education has a very important role in introducing a wider environment, and preparing children to be able to adjust to their surroundings. Many experts explain and provide opinions regarding the importance of early childhood education for each individual

During this pandemic the government implemented physical or social distancing restrictions, the implementation of learning was carried out at home and this also applied to early childhood education, because early childhood is very susceptible to contracting the Covid-19 outbreak for that the government issued a new policy regarding the implementation of learning which is usually done face-to-face. Advance to online and for early childhood the term becomes learning from home or abbreviated as BDR.

In early childhood education, one aspect that must be developed is the aspect of cognitive development based on the Ministry of Education and Culture (2014). Of the six aspects of child development, one of them is the cognitive aspect. Aspects of cognitive development can be interpreted with children being able to learn to think or intelligence, namely the ability to learn skills and solve problems, children's ability to understand what is happening in their environment, and the ability to use memory and solve and solve problems simply (Rohmalina et al., 2020). For this reason, the stimulus carried out to improve good and appropriate cognitive abilities through various kinds of development activities will produce one of the skills needed, namely the ability to solve problems (Witarsa & Dista, 2019). The stages of cognitive development in children are characterized by two stages, namely thinking with realistic objects and symbolic or systematic thinking, where children's thinking skills master the use of symbols, such as letters and numbers (Witarsa & Dista, 2019). Aspects of cognitive development in children can be stimulated from an early age through introducing symbols of letters and numbers so that children can process and use the meaning of these symbols in everyday life based on (Sari et al., 2020) states that the concept of recognizing number symbols is the basis of learning mathematics. that can be introduced to children from an early age. One of the introductions of symbols in children from an early age is number symbols because in everyday life children cannot be separated from mathematical concepts that are systematically organized by discussing logical reasoning and problems involving numbers, space and time so that various ideas are needed to understand and master social, economic and natural problems (Mariam et al., 2019)

According (Roza, 2012) who concluded from the results of a series of studies for 30 years in the United States, that early childhood education programs (0-6 years) can improve achievement or the quality of further learning, and can increase productivity and income in the future.

In essence, early childhood is very different from adults, early childhood has unique characters, including egocentric, curiosity, exploratory, etc., which of course also have a different way of learning from adult learning.

The way children learn in early childhood education starts with the things closest to them, the learning requires more concrete learning media, this is because early childhood knowledge is not as broad as the knowledge of adults who can imagine or understand abstract things.

For this reason, learning that is widely used in implementing learning during the pandemic period, BDR as an effort in the learning process carried out by students and teachers is carried out at their respective homes, as an effort to do activities at home for students to keep their distance from other children and avoid crowds (Ningsih et al., 2016).

In the implementation of BDR teachers as facilitators are obliged to facilitate as much as possible so

that learning is achieved and to make learning effective from home with children while maintaining distance and are accompanied by parents so far many parents who prioritize early childhood academic intelligence are emphasized to be able to think mathematically, whereby having the ability to think mathematically which children can increase activities and strengthen mental in the implementation of the mathematical process. (Rahayu, 2013)

Many methods are used, especially in improving mathematical thinking skills in early childhood. In this case, the researcher uses the open-ended method, which is an approach that helps students solve problems critically and creatively and appreciates the diversity of problem-solving in mathematics (Noer, 2009) why this method is used in early childhood because early childhood answers with various perspectives and understanding of each based on the abilities of early childhood. To implement this research so that early childhood educators find new solutions during BDR and more effective learning with new methods used in improving mathematical thinking skills in early childhood through the Open-Ended method. Based on several previous theories, it was obtained that the learning approach using open-ended was able to stimulate students' mathematical abilities, so the researchers applied an open-ended approach in stimulating mathematical abilities for early childhood. One of the skills that were stimulated was the ability to solve problems. Through the ability to solve problems that are stimulated properly and appropriately given to early childhood, they can provide experience in proving the possibility of these problems, which is followed by discussion and concluding (Lopes et al., 2017). Therefore, this study aims to determine the effect of the open-ended learning approach on the ability to recognize number symbols as part of mathematics lessons that need to be introduced to children from an early age.

## RESEARCH METHODS

The research method used in this study is a quasi-experimental method using the non-equivalent control group design (the nonequivalent control group design). In this quasi-experimental, subjects are not grouped randomly, but researchers accept the subjects as they are (Ningsih et al., 2016) in the study. it used two classes. The first class is the experimental class, while the other class is the control class. In the experimental class, learning is given using a scientific approach and the control class uses ordinary learning (Ningsih et al., 2016)

In the study, which was conducted at the Mother Floria Kindergarden, which was the experimental group, namely class A2 with 12 students, and in the control group, namely class A1 with 12 students. Treatment was carried out in the two groups that were previously pretested first, with the aim of knowing the memory abilities of children in both groups, so that it could be seen whether there was an increase or not in the use of flashcard media on children's memory abilities. The experimental group used flashcard media, while the control group was only subjected to learning as usual. The research designs that will be carried out are:

Table 3.1

Pre-test and Post-test design

| Grup | *Pre-test* | Treatment | *Post-test* |
|---|---|---|---|
| Experiment | ✓ | ✓ | ✓ |
| Control | ✓ | - | ✓ |

(Sukardi, 2009 : 185)

## FINDING AND RESULT

### A. Initial Conditions of Early Childhood Mathematical Thinking Ability Group B Kindergarten Kartika Siwi Before the Implementation of Open-Ended Learning Method

### 1. Early Mathematical Thinking Ability of the experimental group (pretest).

The results of the study showing the initial conditions in the experimental group, namely in class B1 at Kartika Siwi Kindergarten, are presented through tables to describe and explain the data obtained. The frequency distribution of the experimental group's initial learning outcomes is as follows:

**TABLE 4. 1 Early Mathematical Thinking Ability Experiment Group (Pretest)**

| No | Name | Score | Catagory |
|---|---|---|---|
| 1 | Ald | 7 | Middle |
| 2 | Adl | 4 | Low |
| 3 | Azk | 6 | Middle |
| 4 | Azm | 5 | Middle |
| 5 | Dka | 7 | Middle |
| 6 | Fzh | 6 | Middle |
| 7 | Dms | 4 | Low |
| 8 | Nra | 7 | Middle |
| 9 | Rskp | 5 | Middle |
| 10 | Sfra | 4 | Low |

Information :

0 - 4 = Low

5 - 8 = Middle

9 - 12 = High

Based on the results of the pretest in the experimental group, it showed that there were 7 children in the medium category with a percentage of 70%, and 3 children in the low category with a percentage of 30%. The following is the statistical calculation of the data results:

**TABLE 4. 2. Statistical Calculation of Experimental Group Pretest Data**

**Statistics**

eksperimen

| | | |
|---|---|---|
| N | Valid | 10 |
| | Missing | 0 |
| Mean | | 5.20 |
| Median | | 5.00 |
| Mode | | 4[a] |
| Minimum | | 4 |
| Maximum | | 7 |

a. Multiple modes exist. The smallest value is shown

Based on the statistical table above, the experimental pretest value is the mean (average value) which is 5.20 and the median (middle value) is 5.00, and the mode (the value that often appears) is 4. The lowest or minimum value is 4, and the highest or maximum value is 7.

### 2. Mathematical Thinking Ability control group (pretest)

Mathematical Thinking Ability in the control class from the results of the pretest shows the research results which will be described in the following table:

**TABLE 4. 3 Mathematical Thinking Ability Control Group (Pretest)**

| No | Name | Score | Catagory |
|---|---|---|---|
| 1 | Afqh | 4 | Low |
| 2 | Ahly | 5 | Middle |
| 3 | Auf | 6 | Middle |
| 4 | Elvn | 7 | Middle |
| 5 | Irsy | 6 | Middle |
| 6 | Mrz | 4 | Low |
| 7 | Mazm | 5 | Middle |
| 8 | Rzk | 6 | Middle |
| 9 | Rfsy | 7 | Middle |
| 10 | Ysra | 6 | Middle |

Information :

0-4 = Low

5-8 = Middle

9-12 = High

Based on the data above, it can be concluded that the Mathematical Thinking ability in the control group is 2 children in the low category with a percentage of 20%, and in the medium category, there are 8 children with a percentage of 80%.

**TABLE 4. 4 Statistical Calculation of Control Group Pretest Results**

**Statistics**

| | | kelompok | kontrol |
|---|---|---|---|
| N | Valid | 0 | 10 |
| | Missing | 10 | 0 |
| Mean | | | 5.60 |
| Median | | | 6.00 |
| Mode | | | 6 |
| Minimum | | | 4 |
| Maximum | | | 7 |

2. Final Condition of Mathematical Thinking Ability of Early Childhood Group B Kartika Siwi Kindergarten after the Implementation of Open-Ended Learning Method.

a. **Mathematical Thinking Ability End of Experimental Group (Posttest)**

The results of the research on the final ability (posttest) in the experimental group showed differences in the results of the pretest and posttest. The following is explained through the table of the results of the pretest and posttest of the experimental group:

**TABLES 4. 5 . Mathematical Thinking Ability End of Experimental Group (Post-test)**

| No | Name | Score | Catagory |
|---|---|---|---|
| 1 | Ald | 7 | Middle |
| 2 | Adl | 7 | Low |
| 3 | Azk | 8 | Middle |
| 4 | Azm | 7 | Middle |
| 5 | Dka | 8 | Middle |
| 6 | Fzh | 8 | Middle |
| 7 | Dms | 7 | Middle |
| 8 | Nra | 6 | Middle |
| 9 | Rskp | 9 | High |
| 10 | Sfra | 10 | High |

Information:

0 - 4 = Low

5 - 8 = Middle

9 - 12 = High

Based on the posttest results in the experimental group, it showed that there were 8 children in the medium category, with a percentage of 80%, and 2 children in the high category with a percentage of 20%. The following are the statistical results of the data:

**TABLE 4. 6. Statistical Results of Experimental Group Posttest Data**

**Statistics**

eksperimen

| | | |
|---|---|---|
| N | Valid | 10 |
| | Missing | 0 |
| Mean | | 7.70 |
| Median | | 7.50 |
| Mode | | 7 |
| Minimum | | 6 |
| Maximum | | 10 |

Based on the statistical table above, the posttest value of the experimental group is the mean (average value) which is 7.70 and the median (middle value) is 7.50, and the mode (the value that often appears) is 7. The lowest or minimum value is 6, and the highest or maximum value is 10.

a. **Final Mathematical Thinking Ability Control Group (Posttest)**

The results showed the final ability of the control group from the posttest data described in the following table:

**TABLE 4. 7. Mathematical Thinking Ability Control Group (Posttest)**

| No | Name | Score | Catagory |
|---|---|---|---|
| 1 | Afqh | 7 | Middle |
| 2 | Ahly | 7 | Middle |
| 3 | Auf | 6 | Middle |

| | | | |
|---|---|---|---|
| 4 | Elvn | 7 | Middle |
| 5 | Irsy | 4 | Low |
| 6 | Mrz | 6 | Middle |
| 7 | Mazm | 5 | Middle |
| 8 | Rzk | 5 | Middle |
| 9 | Rfsy | 6 | Middle |
| 10 | Ysra | 4 | Low |

Information :

0-4 = Low

5-8 = Middle

9-12 = High

Based on the results of the posttest in the control group, it showed that there were 8 children in the medium category, with a percentage of 80%, and 2 children in the low category with a percentage of 20%. The following are the statistical results of the data:

**TABLE 4. 8. Statistical Results of Control Group Posttest Data**

**Statistics**

kontrol

| | | |
|---|---|---|
| N | Valid | 10 |
| | Missing | 0 |
| Mean | | 7.20 |
| Median | | 7.00 |
| Mode | | 6[a] |
| Minimum | | 6 |
| Maximum | | 9 |

a. Multiple modes exist. The smallest value is shown

Based on the statistical table above, the posttest value for the control group is the mean (average value) which is 7.20 and the median (middle value) is 7.00, and the mode (the value that occurs frequently) is 6. The lowest value (minimum) is 6, and the highest value (maximum) is 9.

1. Test for Normality, Homogeneity, and Independent t-test in the Experiment group and Control group based on the results of the pretest data.

a. Test the normality of the pretest data in the experimental group and the control group.

In this study, the normality test was conducted on the pretest data of the experimental group and the control group was tested using the SPSS 20 program. The results of the normality test of the pretest data in the experimental group and the control group can be seen in the following table:

**TABLE 4. 9. Normality Test Results of Pretest Data in the Experimental Group and Control Group**

**Tests of Normality**

| | | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|---|
| | kelompok | Statistic | df | Sig. | Statistic | df | Sig. |
| skor_pretest | eksperimen | .181 | 10 | .200* | .852 | 10 | .061 |
| | kontrol | .245 | 10 | .090 | .892 | 10 | .177 |

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

The test criteria in the normality test are that if the p-value < 0.05 is obtained then the data distribution is not normal, whereas if the result is > 0.05 then the data distribution is normal, based on the results of the normality test above, it is known if the table data results are obtained more than > 0.05, it can be concluded that the pre-test data of the experimental group and the control group were normally distributed. A. Test the homogeneity of the pre-test data for the experimental group and the control group.

The results of the homogeneity test of the pre-test data in the experimental group and the control group using SPSS 20, can be seen in the following table:

**TABLE 4. 10. Results of Homogeneity of Protest Data Experimental Group and Control Group**

**Test of Homogeneity of Variances**

skor_pretest

| Levene Statistic | df1 | df2 | Sig. |
|---|---|---|---|
| .862 | 1 | 18 | .366 |

Table 4.10 shows the results of the homogeneity test obtained, namely 0.366 so that when compared with the determination rules, 0.366> 0.05, it can be concluded that the pretest data of the experimental group and the control group are similar or homogeneous data.

a. The results of the independent t-test in the experimental group and the control group.

The independent t-test of the pretest data was intended to see the difference in the level of Mathematical Thinking ability in the initial conditions in the experimental group and the control group. After the difference in the pretest data is obtained, the data is processed using SPSS 20, the results of the data are shown as follows:

**TABLE 4. 11. Average Independent Test Score Data Pretest Experiment Group and Control Group**

**Group Statistics**

| | kelompok | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| skor_pretest | eksperimen | 10 | 5.50 | 1.269 | .401 |
| | kontrol | 10 | 5.60 | 1.075 | .340 |

The average value obtained from the results of the independent t-test of the pretest data of the experimental group and the control group shows that the experimental group has an average value of 5.50 and the control group has an average value of 5.60 so that the average value between these two groups close together. While the results of the independent t-test calculations are shown in the following table:

**TABLE 4. 12. T-Independent Test Results Pretest Data Experimental Group and Control Group**

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| skor_pretest | Equal variances assumed | .862 | .366 | -.190 | 18 | .851 | -.100 | .526 | -1.205 | 1.005 |
| | Equal variances not assumed | | | -.190 | 17.525 | .851 | -.100 | .526 | -1.207 | 1.007 |

Based on the results of the independent t-test above, the results in table 4.11 with a p-value of 0.851, then 0.851 > from 0.05 in other words the data is accepted, in the sense that the results of the pretest of the experimental group and the control group showed no significant difference. this means that at the time of the pretest (before given treatment) the level of Mathematical Thinking in the experimental group and the control group there was no difference.

1. Test for Normality, Homogeneity and Independent t-Test Experiment Group and Control Group based on Posttest Data Results

a. Test the normality of the posttest data of the experimental group and the control group.

The results of the posttest data normality test in the experimental group and control group can be seen in the following table:

**TABLE 4. 13. Results of the Posttest Data Normality Test for the Experimental Group and the Control Group**

**Tests of Normality**

| | | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|---|
| | kelompok | Statistic | df | Sig. | Statistic | df | Sig. |
| skor_posttest | eksperimen | .227 | 10 | .155 | .916 | 10 | .328 |
| | kontrol | .202 | 10 | .200* | .878 | 10 | .124 |

*. This is a lower bound of the true significance.
a. Lilliefors Significance Correction

Based on the results of the posttest data normality test above, it is known that if the results in the table above are more than 0.05, it can be concluded that the posttest data of the experimental group and the control group are normally distributed.

a. Test the homogeneity of the posttest data of the experimental group and the control group

**TABLE 4. 14. Results of the homogeneity of the posttest data for the experimental group and the control group**

**Test of Homogeneity of Variances**

skor_posttest

| Levene Statistic | df1 | df2 | Sig. |
|---|---|---|---|
| .047 | 1 | 18 | .831 |

The results of the t-independent posttest data in the experimental group and the control group.

After being given treatment in the experimental group and ordinary learning in the control group, to see a significant difference in Mathematical Thinking ability in the two groups, it was shown through an independent t-test on posttest data with the help of SPSS 20, while the results are shown in the following table:

**TABLE 4. 15. Mean Results of t-Independent Test Score Posttest Data Experimental Group and Control Group**

**Group Statistics**

| | kelompok | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| skor_posttest | eksperimen | 10 | 7.70 | 1.160 | .367 |
| | kontrol | 10 | 5.70 | 1.160 | .367 |

The results of the average value obtained from the independent t-test of the posttest data of the experimental and control groups showed that the average value of the experimental group was 7.70 while the average value of the control group was 5.70. The data shows that the average value of the two groups shows differences. The calculation of the independent t-test of the posttest data of the experimental group and the control group is shown in the following table:

TABLE 4. 16. T-Independent Test Results Posttest Data Experimental Group and Control Group

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| skor_posttest | Equal variances assumed | .047 | .831 | 3.857 | 18 | .001 | 2.000 | .519 | .911 | 3.089 |
| | Equal variances not assumed | | | 3.857 | 18.000 | .001 | 2.000 | .519 | .911 | 3.089 |

Based on the results of the independent t-test, the posttest data showed that the p value was 0.01. And 0.01 < 0.05 so Ho is rejected and Ha is accepted, thus the posttest results (after treatment) are declared to have increased after treatment using beam media.

## B. DISCUSSION

### 1. Initial Condition of Mathematical Thinking Ability of Early Childhood Group B Kartika Siwi Kindergarten.

This research was conducted at Kartika Siwi Kindergarten which is located in the Sawdaya Pusdikpal complex, Karang Mekar Sub-district, Cimahi District, Central Cimahi City. The research was carried out from January to April 2019. The learning process carried out at Kartika Siwi Kindergarten, especially those related to Mathematical Thinking, was still teacher-centred and still emphasized the use of LKA as a learning resource. Teacher-centred learning causes children to be less active in finding their own learning experiences. In addition, the use of LKA as a learning resource does not attract children's interest. Thus, improvement efforts are needed so that Mathematical Thinking in children can develop optimally.

The initial step taken by the researcher before carrying out the research was through observation or observation to find out the child's initial conditions in Mathematical Thinking which included counting, matching, and connecting. Furthermore, the researchers conducted a pretest in the experimental group and the control group. The results of the pretest of the experimental group and the control group showed the average value (mean) of the two groups, namely: 5.20 <5.60, the experimental group in the medium category was 70% and those in the low category were 30%. While in the control group, children in the medium category were 80% and those in the low category were 20%. Based on these percentages, it shows that children in the experimental group and children in the control group, the majority are in the moderate category. Thus, it can be concluded that based on the results of the pretest, there is no difference in the two groups in Mathematical Thinking, so that the two groups still in the medium and low categories.

Based on the results of the researcher's observations on the children of group B in Kartika Siwi Kindergarten, it shows that their Mathematical Thinking ability is not optimal. Children's understanding of the concept of numbers is only limited to mentioning the numbers one, two, three and so on, but the child does not yet understand the meaning of the spoken numbers. This is due to the fact that learning is still teacher-centred and also the lack of variety of teachers in providing learning about numbering. The learning process is still carried out in classical form, so that children's abilities in cognitive

aspects are not honed, especially in Mathematical Thinking.

Kartika Siwi Kindergarten has quite a lot of facilities and infrastructure that can support the teaching and learning process and develop six aspects of early childhood development. It's just that the lack of innovation and creativity of teachers so that the facilities and infrastructure are not maximally useful in the teaching and learning process. This, of course, is one of the factors causing less than optimal learning outcomes for children, especially in Mathematical Thinking.

Block media is one of the media chosen by researchers as a treatment for this Mathematical Thinking lesson. Because blocks are one of the educational game tools (APE) that can stimulate children in the development of cognitive aspects. Block media can be used as a way to develop Mathematical Thinking in early childhood. Through the medium of blocks, children can develop Mathematical Thinking in a fun way and not fixate on boring worksheets. Thus, it is hoped that children will be more interested and easier in developing Mathematical Thinking.

**2. Final Condition of Mathematical Thinking Ability of Early Childhood Group B Kartika Siwi Kindergarten.**

The final conditions in this study were obtained from the posttest results in the experimental group and the control group. In the experimental group, children in the medium category were 80% and in the high category were 20%. Meanwhile, in the control group, the children in the medium category were 80% and the children in the low category were 20%.

The treatment in the experimental group was with beam media, while the treatment in the control group was with ordinary learning, namely the LKA. Based on the results of the percentage of posttest data, it shows that the experimental group has increased from the results of the previous pretest data.

The results of the two post-test data show differences compared to the results of the pretest. This can be seen from the change in scores in each group after being given different treatments. The final results in the experimental group showed that Mathematical Thinking ability experienced a significant change, after the application of the treatment with beam media when compared to the control group who were treated with ordinary learning using children's worksheets (LKA).

The treatment in the form of media blocks in the experimental group really attracted children's interest in learning Mathematical Thinking. Various shapes of blocks are able to arouse the curiosity of children who are very big. The various variations provided by the researcher using the media of blocks were very interesting for the children, and the children became very enthusiastic when the researchers showed and mentioned the shapes of the blocks one by one. Children look more enthusiastic when showing one by one the numbers contained in the blocks so that children are easier to remember the numbers. The use of media provided in learning can provide benefits for children, as for the function and purpose of applying media in children's cognitive development according to (Nurdiana & Asmah, 2021) namely stimulating children to carry out activities, thoughts and feelings, attention and interest in experimenting, investigating or research. As a teaching aid, the media helps clarify something that will be conveyed by the teacher to his students.

The usual teacher-centred learning method applied to the control group did not attract children's attention, so it did not bring much change to Mathematical Thinking. When the learning process was taking place, the children in the control group did not focus on what was conveyed by the researcher,

the children were more preoccupied with other activities including chatting with their friends. After being given different treatments to the two groups, both groups were given a final test or posttest. Based on the posttest data from the experimental group and the control group showed significant results, it can be seen in the independent t-test results from the posttest data of the experimental group and control group, namely the p-value 0.01 means that 0.01 <0.05, the results it shows that the data is significant so that Ho is rejected and Ha is accepted. This shows that there is a significant influence on the provision of learning with block media on the ability to think mathematically in early childhood.

Seeing the results of this study indicate that the use of teaching media that is relevant to the subject and material presented is very good, the presentation is in accordance with previous research, namely:

a. Research by (Sutama, 2021) for the PAUD study program majoring in Pre-School and Elementary Education, Faculty of Education, Yogyakarta State University, with the title "Improvement of Mathematical Thinking Through Number Fishing Games in Group A Children at RA Masyithoh Kalisoka Triwidadi Pajangan Bantul". The result of the research is that the number fishing game in group A has achieved success and has achieved very good criteria.
b. (Pembelajaran & Konvensional, 2013), the PAUD study program, Faculty of Teacher Training and Education, Universitas Muhamadiyah Surakarta, entitled "Efforts to Develop Ability to Recognize Number Concepts through Number Card Games at Permata Hati Kindergarten Kid's School Delanggu Klaten Academic Year 2012/2013". The result of the research is the ability to recognize the concept of numbers is the ability that begins with the lowest order and Mathematical Thinking will be more optimal and interesting if it is done with playing activities using media.

**CONCLUSION**

The results of research conducted at Kartika Siwi Kindergarten with a quasi-experimental method can be concluded as follows:

- In the initial condition (pretest) Mathematical Thinking ability in the experimental group and control group was in the medium and low categories. Because at the pretest the two groups were given the same test using ordinary learning, namely the LKA (there was no treatment).
- In the final condition after being given treatment (posttest) the experimental group showed an increase with the results of children in the medium and high categories, while children in the control group were in the medium and low categories. All this because the two groups were given different treatments, the experimental group was given treatment using the Open-Ended Method, while the control group was given treatment with ordinary learning. Seeing from the results before and after being given treatment, it can be concluded that the use of the Open-Ended Method in improving understanding of the concept of numbers for early childhood is very helpful, due to the attractiveness of the block media, besides being able to be played by arranging various shapes desired by the child.

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