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The Effect of the Montessori Method on Children's Ability to Sort Patterns and Fine Motor Skills in Kindergarten AL Muhajirin

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A B S T R A C T

This study aims to analyze the effect of Montessori method on students' sort patterns and fine motor skills at TK Al Muhajirin. The background of this research is based on the low sort patterns and fine motor skills of students. This research employed a equivalent-experimental method with a pretest-posttest control group design. The research subjects consisted of two class at the B level of TK AL Muhajirin, namely the experimental group treated with the Montessori method and the control group using the demonstration method. The research instruments were in observation sheets, which were analyzed using parametric statistical tests (t-tests) to determine the differences in sort patterns and fine motor skills between the two groups. The results of the analysis showed a statistically significant difference between the experimental group and the control group, with students in learning using montessori method showed a higher increase in sort patterns and fine motor abilities. Therefore, it can be concluded that the application of the montessori method has a positive and significant effect on enhancing students' sort patterns and fine motor skills at TK AL Muhajirin.

Keywords: *Montessori Method, Sort Patterns Skill, Fine Motor Skill*

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INTRODUCTION

Children aged 0-6 years are the age at the age of childhood or golden age. At this age, it is very important to develop children's potential as a whole in terms of cognitive, language, social, emotional, and physical motor (Usman and Kurniawan, 2024). The development of all these potentials comprehensively and sustainably is very meaningful. When providing stimulation to develop these potentials, it is necessary to understand early childhood education. As the Ministry of National Education (2017) stated that the stimulation given to early childhood must be adjusted to its development. One of the basic potentials of children that must be developed is cognitive development (Rahmadhani & Surbakti, 2022).

Cognitive development in early childhood includes children's ability to think more complexly, reason, the ability to remember and solve a problem. According to Irmawati (2020) Cognitive development that is important to be developed in early childhood, especially for children aged 5-6 years is the ability to think logical-mathematically, general knowledge and science, recognizing the concepts of shapes, colors, sizes and patterns, the concept of numbers and number symbols.

The ability to recognize patterns in early childhood is the ability of children to make a sequence of patterns that correspond to the previous sequence, imitate patterns, estimate the next sequence, arrange patterns and create patterns. Lasuka (2018) To express a pattern is to arrange a series of colors, parts, objects, sounds and movements that can be repeated. The ability to recognize patterns that must be mastered by children aged 5-6 years includes the recognition of the abcd-abcd pattern. Pratiwi (2017) Stating that the introduction of patterns in early childhood begins by introducing the most basic pattern in children, namely the AB-AB pattern. Furthermore, when the child is able to identify the basic pattern, challenge the

child to develop and identify more complex patterns such as the aab-aab, abb-abb, abc-abc, abcd-abcd, and others.

Marpirah et al. (2020) shows that the cognitive ability of kindergarten children in sorting the ABCD-ABCD pattern is still not developed optimally such as children who have not been able to distinguish the ABCD-ABCD pattern, out of 15 children only 5 children can sequence the pattern. In line with research conducted by Mahdalena (2019) which shows that there are still many children who have difficulty in sorting objects to the next object.

Based on the results of initial observations carried out on December 5, 2024 on children aged 5-6 years at Al Muhajirin Kindergarten, data was obtained on 8 children out of 15 class B children (ages 5-6 years) whose ability to recognize patterns is in the category of Starting to Develop (MB) or not in accordance with developmental achievement indicators. In addition, from the results of observations on children who are less able to sequence patterns according to patterns that have been determined by teachers independently, namely the abcd-abcd pattern. Children tend to not follow the pattern that has been determined by the teacher so that the pattern arrangement is still reversed. The lack of knowledge of abilities related to the ability to recognize patterns raises concerns that other abilities are also not in accordance with development indicators.

In addition to the development of cognitive abilities, the development of children's motor skills is very important to be developed. Motor abilities are divided into two, namely gross motor and fine motor. Fine motor skills are very important because they affect children's daily lives (Sari et al., 2022). According to Hayati (2019) Fine motor is a movement that uses the smooth muscles or certain parts of the body that are affected by agreement to learn and practice such as the ability to move objects from the hand, doodle, block arrangement, scissors, write, and so on. Nurjani et al (2019) said that there are several ways to develop fine motor skills in early childhood, including: folding, drawing with crayons, shaping or manipulating from clay, wax, dough, painting with watercolors, playing collages, cutting, stringing with rope or thread objects (meronce).

Based on the observations of researchers at Al Muhajirin Kindergarten in carrying out learning in class B, it turns out that there are still many problems in the form of fine motor skills of class B1 children that are still not optimal. This can be seen when the teacher conducts learning with folding activities, there are still children who are stiff and have difficulty folding the right and left sides of the paper to be folded, then there are still children when the cutting process is not according to the pattern on the paper. The fine motor activities provided have not really stimulated children's fine motor skills and inappropriate learning delivery strategies. During the implementation of fine motor related to life skills, namely buttoning the clothes of 15 children, only 5 children were able to hold buttons, pinch with their thumbs and index fingers, press buttons and put them in the buttonholes.

In accordance with the above explanation, one of the efforts in developing the ability to sequence patterns and hone children's fine motor skills is to apply the Montessori method. Usman and Kurniawan (2024) said that the Montessori method pays great attention to the development of cognitive aspects and involves practical practice. According to research Wulandari et al (2018) It states that the Montessori method prioritizes interests and talents in children, builds concepts of thinking, and learns according to their age stages. The Montessori learning method prepares children to understand the surrounding environment well. Learn More Ngewa & Hasis (2022) Explaining the Montessori principle, it emphasizes work experience, so the Montessori method emphasizes outdoor activities and human relationships with the environment, either through direct contact with plants or animals.

Based on the description above, the researcher chose Al Muhajirin Kindergarten to carry out the montessori method in early childhood learning on the ability to sort patterns and fine motor skills of children at Al Muhajirin Kindergarten. The purpose of this research is to determine the influence of the Montessori method on the ability to sequence patterns and fine motor skills of children in Al Muhajirin Kindergarten.

METHOD

The method used in this study is *equivalent control group design* with *pretest-posttest control group design*. This study has two classes, namely the experimental class and the control class (Alpansyah & Hashim, 2021). Then these two classes were given a pretest to find out the initial state before being given treatment, after being given treatment, then both classes were given a posttest to find out the difference in the child's ability after being given treatment (Dewi, 2013).

Table 1. Research Design

Classes	Pretest	Treatment	Postest
Eksperimen	O1	Method Montessori	O2
Controls	O3	Demonstration Method	O4

Sukardi, 2014

There are two types of variables in this study, namely independent variables and bound variables. Where the independent variables in this study are the montessori method for the experimental class and the demonstration method for the control class. Then the bound variable in this study is the ability to sequence patterns and fine motor skills of children. The subjects of this study were 30 children in Kindergarten A l Muhajirin.

Data collection in this study used observation and documentation methods. The observation method uses a data collection instrument in the form of *a checklist* observation sheet. The grid of observation instruments can be seen in table 2.

Table 2. Observation Grids Sequence Patterns and Fine Motor

Variabel	**Aspects Observed**	**Description**
Sort patterns (Penalistyo, 2021).	Children can sort objects based on the ABCD-ABCD pattern	1. Sort objects from smallest to largest
		2. Sort color patterns
		3. Assembling images with ABCD-ABCD pattern
Fine Motor (Sumarni, 2016)	Grasping	1. Can use scissors appropriately
	Eye and hand coordination	2. Can be worn by clothes
	Manipulating objects	3. Can move objects using tools

Table 3. Observation Sheet Assessment

Frequency	**Category**
1	Not Yet Developed
2	Start Growing
3	Not Up to Expectations
4	Very Well Developed

The research data obtained consisted of pretest and posttest data on variables sequencing patterns and fine motor skills of children in the experimental class and the control class. The data analysis technique used is a parametric statistical test (t-test) to see the difference in pattern sequencing and fine motor skills between the two classes.

FINDINGS AND DISCUSSION

Research Results

The results of this study consisted of the results of the analysis prerequisite test and hypothesis test. The results of sequencing patterns and fine motor were analyzed using normality tests, homogeneity tests, and hypothesis tests using t-tests.

Pretest and Posttest Data Sorting Patterns

The initial and final ability data used in this study are the percentage of pretest and posttest results of variables sequencing the pattern of experimental class and control class.

Table 4. Pretest and Posttest Percentages Sorting Patterns

Percentage of Results Sorting Patterns (Y1)	
Experimental Classes	**Control Class**

Pretest	Posttest	Changes	Pretest	Posttest	Changes
41%	92%	51%	43%	67%	24%

Based on the table above, it is known that in the experimental class the percentage of ability to sequence the pretest pattern is 41% and the posttest is 92%. This shows that the ability to sequence patterns after being given learning using the Montessori method has increased by 51%. Meanwhile, in the control class, the percentage of pretst pattern sequencing ability was 43% and posttest was 67%. This shows that the ability to sequence patterns that are given learning using the demonstration method has only increased by 24%.

Fine motor pretest and posttest data

The initial and final ability data used in this study are the percentage of pretest and posttest results of fine motor variables of the experimental class and the control class.

Table 5. Fine Motor Pretest and Posttest Percentage

Fine Motor Outcome Percentage (Y2)					
Experimental Classes			Control Class		
Pretest	Posttest	Changes	Pretest	Posttest	Changes
40%	91%	51%	42%	66%	24%

Based on the table above, it is known that in the experimental class the percentage of fine motor pretest is 40% and posttest is 91%. This shows that fine motor after being taught using the Montessori method has increased by 51%. Meanwhile, in the control class, the percentage of fine motor pretst was 42% and posttest was 66%, This shows that fine motor learners who were given learning using the demonstration method only increased by 24%.

Normality Test Results

The normality test is carried out to find out whether the existing data is normally distributed or not. The results of the normality test can be seen in table 6.

Table 6. Normality Test Results

Variabel	Classes	Saphiro-Wolf		
		Statistics	df	Sig
Sorting Patterns	Pretest Experiments	0,891	15	0,070
	Posttest Experiment	0,887	15	0,061
	Pretest Control	0,891	15	0,070
	Posttest Control	0,887	15	0,084
Fine Motor	Pretest Experiments	0,889	15	0,064
	Posttest Experiment	0,891	15	0,070
	Pretest Control	0,882	15	0,052
	Posttest Control	0,891	15	0,070

Based on the results of the normality test, both classes had a significance value greater than the value of 0.05 (sig > 0.05). Therefore, it can be stated that the pretest and posttest data of the two classes on the variables sequencing patterns and fine motor are normally distributed.

Homogeneity Test Results

The homogeneity test was carried out to find out whether the research sample came from a homogeneous population or not. The results of the homogeneity test can be seen in table 7.

Table 7. Homogeneity Test Results

Variabel	Levene Statistics	df1	df2	Sig
Sorting Patterns	1,562	3	56	0,209
Fine Motor	0,168	3	56	0,918

Based on the results of the homogeneity test, the two classes have a significance value greater than the value of 0.05 (sig > 0.05). Therefore, it can be stated that the pretest and posttest data of the two classes on the variables sequencing patterns and fine motor are homogeneously distributed.

Hypothesis Test Results

The hypothesis test was carried out with the t-test. The data tested were data on the results of the posttest sequencing patterns and fine motor of the experimental and control classes. The results of the t-test can be seen in table 8.

Table 8. T-Test Results

Independent Samples Test

		Mean	Std. Error Deviation	df	Sig (2-tailed)
Sorting Patterns	Equal variances assumed	5,200	0,431	28	0,001
	Equal variances not assumed	5,200	0,431	25,731	0,001
Fine Motor	Equal variances assumed	1,667	0,356	28	0,001
	Equal variances not assumed	1,667	0,356	28,000	0,001

Based on table 8, the results of the t-test on the variable sequencing the pattern were obtained, namely sig. (2-tailed) is 0.001. The significance results showed that the value was < 0.05, then Ho was rejected and Hi was accepted. The results of the t-test can be concluded that the Montessori method has a significant effect on the ability to sequence children's patterns in Al Muhajirin Kindergarten.

The results of the t-test on the fine motor variable were obtained results, namely sig. (2-tailed) is 0.001. The significance results showed that the value was < 0.05, then Ho was rejected and Hi was accepted. The results of the t-test can be concluded that the Montessori method has a significant effect on the fine motor skills of children in Al Muhajirin Kindergarten.

Discussion

Based on the results of the study in table 4, it shows that the ability to sequence children's patterns increases with the application of the Montessori method in the learning process. Based on the t-test, the results were obtained that the Montessori method had a significant effect on the ability to sequence children's patterns. This is in accordance with the research of Aziza et al. (2020) who stated that the Montessori method can improve children's learning outcomes in pattern material.

According to Usman and Kurniawan (2024), learning using the Montessori method is able to create children who are independent, creative, and active in learning. The use of the Montessori method has a great effect on the ability to sequence patterns, where children have more opportunities and are more active in learning using various media such as geometric blocks and colored letters. The Montessori method is very effective and is able to encourage children to develop their skills to the maximum.

Meanwhile, in the control class, the percentage of pretest ability to sequence patterns was 41% and the posttest was 92%. This suggests that the demonstration method can also improve the child's ability to sequence patterns, but it is not as effective as using the Montessori method. This is because in the learning process using the demonstration method, children are not actively involved in learning so they are less effective in improving understanding.

Based on the results of the study in table 5, it shows that children's fine motor skills are increased by the application of the Montessori method to the learning process. Based on the t-test, it was found that the Montessori method had a significant effect on children's fine motor skills. This is in accordance with research by Aditya et al (2024) who said that the Montessori method is effective in developing children's fine motor skills.

The Montessori method is an approach that emphasizes daily life skills designed to hone children's abilities such as washing hands, buttoning clothes, pouring water and completing other routine tasks (Fajarwati, 2015). The goal of the Montessori method is to give children the freedom to develop themselves by doing activities that are in accordance with the child's abilities and age and organizing fun learning (Aditya et al., 2024).

The description of the results of the study can be concluded that learning using the Montessori method is more interesting and makes it easier for children to improve their ability to trace patterns and fine motor skills.

CONCLUSION

The Montessori method is very effective in developing the ability to sequence the patterns of children in Kindergarten AL Muhajirin, because this method leads children to learn

actively and creatively. This method uses repetitive learning, instilling discipline and self-control in children so that children play an active role in learning activities. The Montessori method is very effective in developing the fine motor skills of children of Al Muhajirin Kindergarten, because this method frees children to explore the environment, teach independence, carry out interesting activities such as demonstrations and learning while playing so that children's motor development can develop. Based on the results of the research and discussion, it can be concluded that the montessori method has a significant effect on the ability to sequence patterns and fine motor skills of children of Kindergarten AL Muhajirin for the 2024/2025 school year.

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