

The Influence of Spinning Wheel Media on the Development of Symbolic Thinking in Children Aged 5-6 Years

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Abstract

The development of symbolic thinking in early childhood in the learning process is still experiencing difficulties. This research aims to identify, understand, solve problems, using symbols of numbers, vowels and consonants as provisions to enter Basic Education. This study uses a quantitative approach with a type of one grub pre test and post tets design experiment design with a sample of 14 children. The data collection technique uses an initial test (pretest), treatment (traiment) and final test (posttest). The data analysis technique used is a statistical test using validity, reliability, normality, homogeneity, and paired T Test Sample. Based on the results of the calculation of the development of children's symbolic thinking before treatment, which is on average 30.07 (53.6%) is still at the level of undeveloped, after being given treatment, it develops to 50.21 (89.6%) so that it can be seen that the child's symbolic thinking ability has increased by 20.14 (36.0%). So that the spinning wheel media has a positive influence and significant changes on the development of symbolic thinking in children aged 5-6 years at Ittihad Samarinda Kindergarten.

Keywords

Early Childhood; Spinning Wheel Media; Symbolic Thinking



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INTRODUCTION

Early childhood is known as the golden age (*golden age*), that is, children are very sensitive to various types of stimuli and education that children receive (Son, 2022). Early childhood is a child who requires various educational efforts to optimize all aspects of child development, both physical and psychological, such as intellectual, language, motor, and social-emotional development (Arifudin, 2021).

Children's cognitive is one of the main focuses because it is the basis for more complex thinking skills for the future. Cognitive is the ability to learn, think, or be intelligent, which includes new skills, skills and concepts (Kusumastuti, 2021). Cognitive development is divided into problem-solving, logical thinking, and symbolic thinking. Of the three scopes of cognitive development, one of the most important aspects to pay attention to is the development of symbolic thinking. Symbolic thinking skills are part of cognitive development

related to the ability to remember and think using symbols, symbols of numbers and letters, and imagining objects that do not exist using symbols of numbers and letters (Priyono, 2021).

There are several theories of indicators of the achievement of symbolic thinking development of children aged 5-6 years according to the theory Lonigan, (2008) i.e. 1) Recognize letter symbols, 2) Use letter symbols, 3) Arrange symbols, 4) Understand the relationship between sound letters. 5) Recognize rhymes, 6) Write symbols, 7) Match symbols. According to the theory Collins and Lascivious, (2019) namely: 1) identifying letter symbols and their sounds, 2) the ability to recognize rhymes, 3) identifying number symbols, 4) knowing the quantity of numbers, 5) comparing numbers, 6) solving the problem of adding and subtracting. According to Dehaene, (2001) Namely 1) mentioning the number symbol, 2) counting the number symbol, 3) matching the number symbol, 4) mentioning and showing the vowel and consonant letter symbols, 5) imitating the writing of the number symbols of vocal letters and consonants, 6) imitating the writing of number symbols.

Based on the above explanation, it can be related that the ability to think symbolically about the recognition of numbers and letters is part of cognitive development in the pre-operational stage. Recognition of numbers and letters is very important for children aged 5-6 years, because this is the first step in the process of reading, writing, and arithmetic. This ability to think symbolically also affects the next level of education, which will facilitate the child's learning process. So that the researcher can draw conclusions that indicators of symbolic thinking for the achievement of children aged 5-6 years include 1) mentioning and showing vowel and consonant symbols, 2) imitating vowel and consonant symbols, 3) arranging symbols, 4) mentioning number symbols, 5) imitating number symbols, 6) matching symbols, 7) solving addition and subtraction problems.

Developing symbolic thinking skills in early childhood through various interesting and effective learning methods. One of the methods that can be used is through interactive educational media such as using learning media. Learning media is a tool used by teachers to convey messages to learners, so that the message can be received well (Saleh, 2023). Learning media is a learning resource that uses tools to increase insight (Nurrita, 2018). The use of learning media has a significant effect on learners, because with these media, learners can more easily understand the purpose and intent of the material presented.

The media used to attract children's interest in learning and in accordance with the characteristics of early childhood is the rotating wheel media. The rotating wheel media is one of the circular learning media that can be rotated and contains various pictures, numbers, letters, colors, or symbols according to the learning objectives (Nuzula, 2023). According to Febriani and Nurhafizah, (2024), rotary wheel media is an interactive visual media that combines elements of play with learning so that it can help children understand basic concepts, especially the concept of numbers.

Based on pre-observations conducted by researchers at Ittihad Kindergarten located in Samarinda City in 2025. During the pre-observation process, the ability to think symbolically in early childhood has not reached an optimal level. This can be seen from the number

symbols from 1 to 10 in order and sometimes mistakenly recognize several numbers, and still have difficulty using number symbols in counting activities. In addition, children who have not yet learned to recognize vowels and consonants well. This lack of symbolic thinking skills is learning that tends to be teacher-centered, so it does not attract children to participate actively. In fact, introducing number symbols, vowels and consonants to children is very important for children's readiness to pursue further education.

This study aims to determine the influence of spinning wheel media on the development of symbolic thinking in children aged 5-6 years in Ittihad Kindergarten, Samarinda City. It is hoped that by using this media, children will more easily understand and master basic concepts that are important for children's cognitive development, so that children are better prepared to enter primary education. This study seeks to fill the literature on the effectiveness of spinning wheel media in supporting early childhood symbolic cognitive development, which has not been widely explored in the context of education in Indonesia. It is hoped that the results of this study will not only enrich the early childhood education literature in Indonesia but also offer innovations in the use of interactive learning media to support children's cognitive development optimally.

METHODS

This research uses a quantitative method with an experimental design type. On scientific principles, such as objectivity, measurability, rationality, empirical, and systematic. The main characteristic of the quantitative approach lies in the use of data and then analyzed using objective and accountable statistical techniques. The sampling technique used in this study is a saturated sampling technique. Because sampling involves all members. This technique is used with a relatively limited population, so that all members of the population can be used as a source of research data. The sample of this study is children aged 5-6 years in 1 class B which consists of 14 children. This research will be carried out in 2025 at Ittihad Samarinda Kindergarten.

The type of research used in this study is experimental design that applies one group pretest and posttest design. The design of the pretest and posttest is carried out with one group by carrying out an initial test (pretest) before applying the treatment, after the treatment is carried out, then giving the final test (posttest). By comparing the results of the performance and posttest, the effect is great to see the changes that have occurred. The data validity test technique used in this study uses 1 Expert Lecturer at Mulawarman University. Furthermore, research instruments that have been declared valid or suitable for use will be tested on data groups which will then be observed and evaluated. The data analysis technique used in this study to see the comparison of pre-treatment and post-treatment results (posttest) to the experimental group used validity tests, reliability tests, normality tests, homogeneity tests, and paired T-test samples.

The research instruments used in collecting data in this study are guided by 3 theories, namely, Lonigan theory, (2008), Collis Laski's theory, (2019), and Dehaene's theory, (2001), to

determine the influence of spinning wheel media on the development of symbolic thinking in children aged 5-6 years at Ittihad Samarinda Kindergarten. In this study, statements and list questions were used before and after treatment. This research used a rating scale with BB (not yet developed) score 1, MB (starting to develop) score 2, BSH (developing as expected) score 3, and BSB (developing very well) sector 4.

This research instrument is used in collecting research data to determine the influence of spinning wheel media on the development of symbolic thinking in children aged 5-6 years at Ittihad Samarinda Kindergarten as a predetermined research sample. In this study, the research instruments that have been determined are the play test without using media and the play test using spinning wheel media. Therefore, research instruments as a measuring tool that can be used or standard to collect valid data in research must pass the validity test.

FINDINGS AND DISCUSSION

Pretest Score Results and Posttest Scores

Based on the results of the pretest and posttest assessments on children aged 5-6 years at Ittihad Samarinda Kindergarten, an overview of the child's ability before and after being given treatment using the rotating wheel media was obtained. At the pretest stage, the highest score was a score of 40, while the lowest score was 19. Meanwhile, at the *posttest* stage, the highest score was 56 and the lowest score was 42. This increase shows that the child's ability after participating in learning activities has improved compared to the condition before being given treatment. These results give an idea that the use of rotating wheel media can provide a more interesting learning experience and help children in participating in learning activities, so that the skills that are the focus of the research can develop better.

The following is a table of prettest and posttest for children aged 5-6 years with a total of 14 children at Ittihad Samarinda Kindergarten.

Table 1. Pretest Score Results and Posttest Scores

	Total	Average	Standard Deviation
Pretest	421	30.07	8.052
Posttest	703	50.21	5.753

Based on the above research data, the pretest score before treatment with a total of 14 children, namely a total pretest score of 421, the average score was 30.07 and the standard deviation was 8,052. And the posttest research data after treatment in the form of a spinning wheel media on the ability to think symbolically had a total score of 703, the average score was 50.21 and the standard deviation was 5,753.

The researcher used 1 expert, namely a lecturer at Mulawarman University Samarinda, namely Mrs. Febry Maghfirah, S.Pd, M.Pd. The question was validated and declared feasible or unsuitable to be used as a research instrument. The results of the 14 research instruments contained in the observation sheet were declared suitable for use as tests on children.

Table 2. Research Instruments

Variabel	Sub Variabel	Indicator	Sub Indicator
Cognitive	Symbolic Thinking	Mention and show the symbol of vowels and consonants	1. The child mentions and shows vowels (a, i, u, e and o)
			2. The child pronounces and shows consonant letters (b, c, d, g, h, j, k, l, m, n, p, q, r, s, t, v, w, x, y, z)
			3. The child says the word at the beginning of the letter
		Imitating the writing of vowel and consonant symbols	4. Children imitate the writing of vowels (a, i, u, e and o)
			5. Children imitate the writing of consonant letters (b, c, d, g, h, j, k, l, m, n, p, q, r, s, t, v, w, x, y, z)
		Organizing the emblem	6. Children compose simple words using the beginning of vowels
			7. Children arrange words using the beginning of consonants
			8. Children arrange the numbers 1 to 10
			9. Your child says the symbol of numbers 1-10
		Mention the number symbol	10. Children imitating the writing of symbols numbers 1-10
			11. The child matches the words according to the picture
		Imitating the writing of number symbols	12. The child matches the number symbol according to the sum of the numbers
		Matching emblems	
		Troubleshoot addition and subtraction issues	13. The child can add up the number of
			14. Children can reduce the number of children who get

Table 3. Recapitulation of Symbolic Thinking Ability Instrument Validity Test

No	Butir	Calculation	rtabel	Status
1		0,755	0,576	Valid
2		0,788	0,576	Valid
3		0,826	0,576	Valid
4		0,867	0,576	Valid
5		0,867	0,576	Valid
6		0,862	0,576	Valid
7		0,862	0,576	Valid
8		0,728	0,576	Valid
9		0,823	0,576	Valid
10		0,867	0,576	Valid
11		0,878	0,576	Valid
12		0,812	0,576	Valid

13	0,737	0,576	Valid
14	0,762	0,576	Valid

Based on the results of the feasibility test analysis, you can use the SPSS 26 For Windows program by testing cronbach alpha on the significance letter cornbach alpha > 0.6 , then it is said to be reliable, on the other hand, if the conbach alph is < 0.6 , it is said not to be reliably distributed. A significance value of 0.962 was obtained. Based on the output of the reliability test on SPSS, the value is significant

Table 4. Results of Instrument Reliability of Symbolic Thinking Ability

<i>Reliability Statistics</i>	
Cronbach's Alpha	N of Items
.962	14

The results of the liliefors test can be seen from the Kolmogroff sminov test because as written in the table below the results of the liliefors test are the same as the results of the Kolmogroff Smirnov test, only in the basic liliefors test the decision is seen from the liliefors table if the statistical results of the liliefors test (Lo) $< L_{table}$ and the significance value > 0.05 , then it is considered a normal distribution. For $n = 14$, the statistical pretest value of the lifors test obtained was $0.178 < 0.200$ and the posttest value of the lifors test statistics was $0.192 < 0.200$ with a pretest significance value of $0.200 > 0.05$ and a posttest significance value of $0.200 > 0.05$. From the analysis, it can be concluded that the data is normally distributed because it is seen from the statistical completeness of the liliefors test with a value of < 0.200 and a significant value of 0.05.

Table 5. Results of Normality of Symbolic Thinking Ability
Tests of Normality

		Kolmogorov-Smirnova		Shapiro-Wilk		
	Statistic	Df	Say.	Statistic	df	Say.
Pre-test	.178	14	.200*	.961	14	.744
Post-test	.192	14	.200*	.903	14	.273

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

a. Lilliefors Significance Correction

Based on the results of the homogeneity test analysis of SPSS variation 26 for windows with test levane, At a significance level of 0.05, a significance value was obtained in the pre-test and post-test of children aged 5-6 years at Kindergarten Ittihad Samarinda, which was 0.432. The significance value obtained was $0.432 > 0.05$, meaning that the sample in this study came from a homogeneous population.

Table 6. Results of Homogeneity of Instruments of Symbolic Thinking Ability
Test of Homogeneity of Variances

		Levene Statistic	df1	df2	Say.
Learnin g Motivati on	Based on Mean	1.040	3	7	.432
	Based on Median	.672	3	7	.596
	Based on Median and with adjusted df	.672	3	4.000	.613
	Based on trimmed mean	1.076	3	7	.419

The values of the minimum, maximum value, mean value (average) and standard deviation (standard deviation) in children aged 5-6 years at Ittihad Samarinda Kindergarten have significant changes, where in the pretest results it can be seen that the data on the number of 14 children is 19, the maximum value is 40, the mean value (average) is 30.07 and the standard deviation (standard deviation) is 8,052 while the minimum value posttest is 42, the maximum value is 56, the mean value (average) is 50.21 and the standard deviation (standard deviation) is 5,753 so that it can be seen that the child's thinking ability has increased by 20.14 by providing treatment to children using the medium of a rotating wheel on the symbolic thinking ability of children aged 5-6 at Ittihad Samarinda Kindergarten.

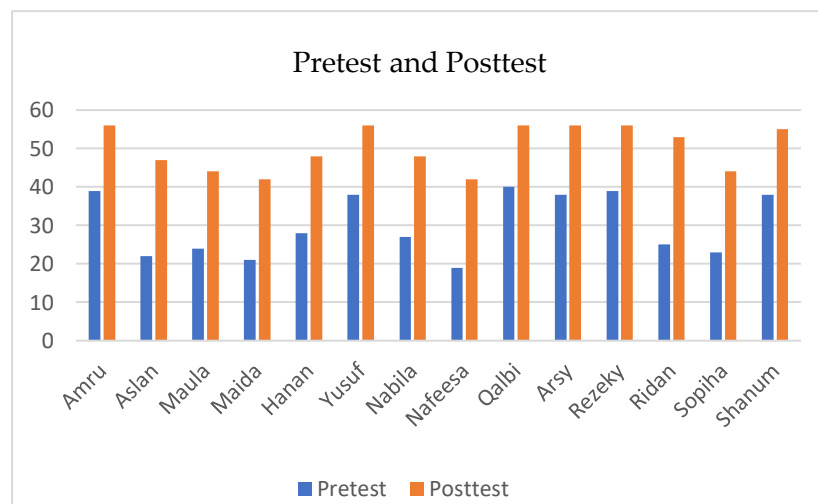


Figure 1. Increase in Pretest Scores and Posttest Scores

The hypothesis test in this study used the paried sample T-test in the SPSS 26.0 for Windows program at a significance level of 0.05. The average difference in the results of the pretest and posttest of the symbolic thinking ability of children aged 5-6 years at Kindergarten Ittihad Samarinda can be seen in the output of the Paried Sample T-test, namely the significance of the assumed equal variance (the result of the parametric sample t-

test) where the results can be seen the value of sig. (2-tailed) 0.000, on the basis of decision-making it is known if the value of sig. (2tailed) < 0.05 , the data showed a significant difference between the pretest and posttest of measurement ability using rotating wheel media in children aged 5-6 years at Kindergarten Ittihad Samarinda.

Table 7. Hypothesis Results of Symbolic Thinking Ability Instruments

Paired Samples Test								
Paired Differences								
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
	Lower	Upper						
Pair1 Pre-test - Post-test	-20.143	3.416	.913	-22.115	-18.170	-22.062	14	.000

Hipotesis:

H0: There was no effect of rotating wheel media on symbolic thinking skills in children aged 5-6 years at Ittihad Samarinda Kindergarten

Ha: there is an influence of spinning wheel media on the symbolic thinking ability of children aged 5-6 years at Ittihad Samarinda Kindergarten.

Using a significance value of 0.05, it rejects H0 and accepts Ha with $T_{\text{calculated}} > T_{\text{table}}$, from the results of the analysis obtained the value sig, $0.000 < 0.05$ and the value of $t_{\text{calculated}} = 22,062 > T_{\text{table}} = 2,145$. This shows that the spinning wheel media has a significant positive influence on the symbolic thinking ability of children aged 5-6 years at Ittihad Samarinda Kindergarten

Discussion

Based on the results of research and discussion, the use of spinning wheel media on symbolic thinking ability has significant changes and influences on the measurement ability of children aged 5-6 years at Ittihad Samarinda Kindergarten. This can be seen from the results of the calculation of changes before and after treatment, the pretest score with a total of 14 children, namely the minimum value is 19, the maximum value is 40, the mean value (average) is 30.07 (53.6%) and the standard deviation (standard deviation) is 8,052.

Posttets research data after treating the spinning wheel media play on the ability to think symbolically has a minimum value of 42, the maximum value is 56, the mean (average) is 50.21 (89.6%) and the standard deviation (standard deviation) is 5,753, so it can be seen that the child's measurement ability increased by 20.14 (36.0%) and had a significant effect as evidenced by the value of sig, $0.000 < 0.05$ and the value of $t_{\text{count}} = 22,062 > T_{\text{table}} = 2,145$ this shows that the spinning wheel media has a significant positive influence on the symbolic thinking ability of children aged 5-6 years at Ittihad Samarinda Kindergarten.

This is corroborated by Susmiarni and Atika, (2023) which states that this media helps children recognize the concept of numbers, increases concentration, and encourages children to be active in connecting symbols with the concepts learned so that learning becomes more interesting and meaningful. This is corroborated by Febriani and Nurhafizah (2024) who stated

that the use of rotary wheel media can help develop children's ability to recognize the concept of numbers and letters through interesting and interactive play activities.

So, through the media of the rotating wheel, children will find it easier to recognize the symbols of numbers, vowels and consonants, order, and understand simple symbols. In addition, teachers at Ittihad Samarinda Kindergarten gave positive responses and suggested that this media continue to be developed by adding a variety of activities and supporting materials so that learning is more interesting and optimal.

CONCLUSION

Based on the results of the research, rotating wheel media has a positive influence and significant changes on symbolic thinking skills in children aged 5–6 years. The use of this media has been proven to be effective in helping children recognize number symbols, vowel symbols and consonants, sort, and understand simple symbols through interesting, interactive, and fun learning activities. In addition, rotating wheel media is able to increase children's attention, interest, activeness, and enthusiasm during the learning process so that learning activities become more meaningful and learning goals can be achieved optimally. This finding is in line with the results of hypothesis tests that show that rotating wheel media has a significant effect on the symbolic thinking ability of children aged 5–6 years at Ittihad Samarinda Kindergarten.

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