The Effect of Labyrinth Games on the Concentration Ability of Children Aged 5-6 Years in Kindergarten

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Abstract

This study aims to evaluate the effect of maze games on the concentration ability of children aged 5-6 years in kindergarten. Concentration is an important element in children's cognitive development that plays a crucial role in the learning process as well as daily activities. Labyrinth games were chosen as the object of research because they were considered able to stimulate children's focus and attention through interesting and challenging activities. This study used an experimental method with a pretest-posttest control group design. The subjects of the study consisted of kindergarten children aged 5-6 years, who were divided into two groups: an experimental group that was subjected to maze game treatment and a control group that was not. The instrument of this study is a concentration test adapted specifically for early childhood. The results showed a significant improvement in concentration ability in the experimental group compared to the control group. These findings indicate that maze play may be an effective alternative learning strategy for improving early childhood concentration. The implication is that educators can consider the integration of maze games in learning activities in kindergarten to support the development of children's cognitive abilities.

Keywords: maze games, concentration, early childhood, kindergarten

Introduction

Early childhood education focuses not only on academic aspects but also on the development of social, motor, language, and independence skills. Early childhood education programs are designed to create a safe, enjoyable, and stimulating learning environment for children, aiming to help them develop their potential optimally, prepare them for further formal education, and build a strong foundation for their future lives [1]–[3].

The success of learning depends on the achievement of learning goals, which are influenced by various factors, including students' learning priorities [4], [5]. Concentration, as an important cognitive ability, allows children to focus on tasks, absorb information, and process it effectively. At the age of 5-6 years, children enter the stage of formal education in kindergarten (TK), where they learn basic skills that will form the basis for further education.

In this context, various methods and approaches have been developed to enhance children's concentration abilities, including the use of educational games [6], [7]. Maze games, which challenge children to find a way out of a complex path, can

improve concentration as well as critical and strategic thinking [8], [9].

Initial observations indicate concentration problems among children in TK, mainly due to non-conducive classroom conditions [10]. Therefore, this research aims to examine the influence of maze games on the concentration abilities of 5-6-year-old children in TK, with the hope of finding empirical evidence regarding the effectiveness of these games and providing practical recommendations for educators.

Children aged 5-6 years are in a critical stage of cognitive and motor development, where games play a crucial role in helping their development [11]. Concentration in early childhood is greatly influenced by the environment and the types of activities they engage in. Maze games have been proven effective in improving concentration as well as cognitive and motor skills in children.

The implementation of maze games in TK can be done in various forms and provide challenges suitable for the needs and abilities of children. Research shows that children engaged in maze games demonstrate a significant improvement in their concentration abilities. Thus, maze games have considerable potential to enhance the concentration of early childhood children in TK.

Method

This research is descriptive-analytical, as it provides an overview of the influence of maze games on the concentration abilities of 5-6-year-old children at TK Al-Barokah Empat Lawang. The approach used by the researcher is quantitative. Quantitative research is a systematic scientific study of parts, phenomena, and their relationships. Quantitative research aims to develop and use mathematical models (assisted by SPSS), theories, or hypotheses related to natural phenomena. The research type uses the Intact-Group Comparison method. In this design, one group is used for the study, but it is divided into two groups, with half the group for the experiment and half for the control group [12].

The population and sample in this research are the TK Al-Barokah located in Muara Danau district, Lintang Kanan sub-district, Empat Lawang Regency, South Sumatra, which consists of 17 children in group B. This study uses data collection techniques in the form of checklist sheets, observation, and documentation. The method used to analyze data to test the research hypothesis is the t-test (pair test). Before conducting hypothesis testing, preliminary tests are carried out, namely normalization gain analysis, normality test of data distribution, and homogeneity test of variance.

Results and Discussion

Table 1. Pretest Data of Experimental Class Concentration Ability of Children Aged 5-6 Years

No	Name	Experimental Class Pretest Data									
		Indicator									
		1	2	3	4	5	6	7	8	x	%
1	Dafi	2	2	2	2	1	1	1	1	15	46,8%
2	Syafiq	2	1	1	1	2	1	2	2	13	40,6%
3	Khaliq	2	2	2	2	2	1	2	2	13	40,6%
4	Mista	1	2	2	1	2	1	1	2	12	37,5%
5	Nadira	1	1	2	2	1	1	1	1	12	37,5%

6	Kirana	1	2	2	1	1	1	1	2	12	37,5%
7	Huara	2	2	1	2	1	2	2	2	15	46,8%
8	Nayra	2	2	2	1	2	1	1	2	14	43,7%
9	Aqlan	1	1	2	2	1	2	1	1	13	40,6%
10	Nadifah	1	1	2	1	2	2	2	2	13	40,6%
11	Faris	2	2	1	2	2	1	2	2	15	46,8%
12	Nayyira	2	1	1	1	2	1	2	1	13	40,6%
13	Nabila	1	2	1	2	2	1	2	1	13	40,6%
14	Cinta	1	2	1	1	1	2	2	1	13	40,6%
15	Ratifah	2	1	1	2	2	1	1	1	11	34,3%
16.	Glorisa	2	1	1	1	2	1	1	1	11	34,3%
17.	Rendy	1	1	2	1	1	2	1	1	11	34,3%
	Total	**25**	**26**	**29**	**25**	**27**	**22**	**25**	**25**	**219**	**615,1%**
	Ideal Score	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**		
	%	**41,67%**	**45%**	**41,67%**	**41,67%**	**45%**	**35%**	**41,67%**	**45%**	**41,04%**	
	Average										**60,00**

Based on the table of the results of the assessment of the concentration ability of children aged 5-6 years pretest in the experimental class above, it can be seen that the value of the observations that have been made on children aged 5-6 years at Al-Barokah Empat Lawang Kindergarten, Muara Danau village, Lintang Kanan district, Empat Lawang regency, South Sumatra, before the maze game was applied using a concentration ability assessment instrument for children aged 5-6 years.

Table 2. Percentage category of pretest results

Mastery Level	Category	Pretest Concentration Ability of Children Aged 5-6 Years	
		Frequency	Presented
X < 5	Low	6	39%
5 ≤ X < 7	Keep	11	61%
X ≥ 7	Tall	0	0%
Total		**17**	**100%**

The table above shows the concentration ability of children aged 5-6 years in Al-Barokah Empat Lawang Kindergarten, Muara Danau Village, Right Latitude District, Four Lawang Regency, South Sumatra, Before being given treatment. There were 6 students in the low category with a percentage (39%) and 11

students in the medium category with a percentage (61%).

Table 3. Postest Data of Experimental Class Concentration Ability of Children Aged 5-6 Years

No	Name	Data Postes Experiment Class									
		Indicator									
		1	2	3	4	5	6	7	8	x	%
1	Dafi	4	4	4	4	4	4	4	4	32	100%
2	Syafiq	4	4	4	4	4	4	4	4	32	100%
3	Khaliq	4	4	3	4	4	4	4	4	31	96,8%
4	Mista	4	4	3	3	4	4	4	4	30	93,7%
5	Nadira	4	4	3	3	4	4	4	3	29	90,6%
6	Kirana	4	3	3	2	4	4	4	4	28	87,5%
7	Huara	4	4	2	4	4	2	4	4	28	87,5%
8	Nayra	4	3	2	4	4	2	4	4	27	84,3%
9	Aqlan	4	3	4	4	3	2	3	4	27	84,3%
10	Nadifah	4	4	4	4	4	3	4	4	31	96,8%
11	Faris	4	4	4	4	4	3	4	4	31	96,8%
12	Nayyira	2	2	4	4	4	3	4	2	24	75%
13	Nabila	2	4	4	2	4	4	4	2	26	81,2%
14	Cinta	2	4	4	2	4	3	4	2	25	78,1%
15	Ratifa	4	4	4	2	4	2	4	4	28	87,5%
16	Glorisa	4	3	2	3	2	4	2	3	26	81,3%
17	Rendy	3	2	3	4	3	3	4	3	29	90,6%
	Total	54	55	52	50	59	47	59	53	429	1.340,1
	Idealy Score	60	60	60	60	60	60	60	60		

	%	90 %	91,67 %	86,67 %	83,33 %	98,33 %	78,33 %	98,33 %	88,33 %	89,37 %	
	Average										89,34 %

The table above shows the results of the assessment of the concentration ability of children aged 5-6 years posttest in an experimental class conducted at Al-Barokah Empat Lawang Kindergarten. After the treatment, a maze game using an assessment instrument was used to develop the concentration ability of children aged 5-6 years.

Table 4. Percentage category of posttest results

Mastery Level	Category	Pretest concentration ability Children 5-6 years (s)	
		Frequency	Presented
X < 11	Low	0	0%
11 ≤ X < 13	Keep	1	17%
X ≥ 13	Tall	16	83%
Total		17	100%

The table above shows the concentration ability of children aged 5-6 years in Al-Barokah Empat Lawang Kindergarten. After being given treatment, there was 1 student in the medium category with a percentage (17%) and 16 students in the high category with a percentage (83%). So, it can be concluded that the post-test rate is in the high category.

Hypothesis Testing

Normality Test

A normality test is performed to find out whether the data is normally distributed or not. A distribution is said to be normal if the significance is >0.05, and vice versa if the significant level is < 0.05, then a distribution is said to be abnormal. The results of the normality test on the data obtained in the study show that the data is normally distributed. The results of calculating the normality test using the help of SPSS version 20.0, namely with the Kolmogorov-Smirnov test, are as follows:

Table 5. Test Results Normality Test With SPSS

Tests of Normality						
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
Pretest	.239	17	.011	.830	17	.005
Posttest	.272	17	.002	.821	17	.004

In the normality test, the significance result for the pretest is 0.005, and the significance result for the posttest is 0.004. This shows that the data is normally distributed because, based on normality decision-making guidelines, if the significance value > 0.05, then the data is normally distributed. It can be concluded that the data is normally distributed.

Homogeneity Test

The homogeneity test is carried out to ensure that the data set to be measured does indeed come from a homogeneous (equal) population. Homogeneity shows that the data obtained from the results of the study are very homogeneous. The data group shows homogeneous or derived from populations that have the same variance if the significance value is >0.05, while if the significance value is.

Table 6. Output Results of Homogeneity Test with SPSS

Test of Homogeneity of Variances

Homogenitas

Levene Statistic	df1	df2	Sig.
.036	3	40	.991

Based on the test of the homogeneity of variances table, the sig value is 0.991, and it can be concluded that the sample has the same variance.

Uji Paired Sample t-Test

Paired t-test (paired sample t-test) is the average test of two groups of pretest and post-test data. This study provides two different treatments, namely pretest and posttest, so as to obtain two data, namely,

pretest (before treatment / before treatment using the Labyrinth game and posttest (after treatment / after treatment using the Labyrinth game). This paired t-test was analyzed using SPSS application version 20.0. The hypothesis tested in this study is that there is a difference in the average influence of maze games on the concentration ability of children aged 5-6 years in Al-Barokah Four Lawang Kindergarten.

Table 7. Paired t-test Output Results with SPSS

Paired Samples Test

		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	Pretest Exp - Postes Exp	-14.133	3.091	.798	-15.845	-12.422	-17.711	14	.000

Based on the paired sample t-test table, a significance of 0.000 is obtained at a level less than the significant level of >

0.05. This means that there is a substantial difference between the average value before the maze game is applied and the

average value after the maze game is applied.

Based on the values above, it can be concluded that maze games do influence the concentration ability of children aged 5-6 years.

Based on the results of the research that has been done, it can be known that the ability of children to concentrate through maze games is very good. This is evidenced by the very significant difference (0.001<0.05) between the group that did not do the maze game and the group that did the maze game—according to Yuliani Nurani explained that maze games involve the task of finding a way out of complicated structures, which requires full attention and problem-solving. Studies by Smith and Jones (2018) show that maze games can improve children's cognitive abilities, including concentration, memory, and problem-solving skills. These games encourage children to focus on tasks, follow routes thoroughly, and ignore irrelevant distractions. The implementation of maze games in kindergarten can be done in various forms, including physical mazes that children can walk through, picture mazes on paper, or digital mazes. Each form provides different challenges and can be adjusted to the needs and abilities of children. Teachers can use these games as part of the learning curriculum to improve concentration and other cognitive skills.

Research by Johnson and Williams (2020) showed that children who engaged in maze games for 15-20 minutes per day showed significant improvements in their concentration abilities compared to a control group that was not involved in such games. In addition, this game also helps in improving eye-hand coordination and fine motor skills (Fadjariyanti, F., & Fathiyah, K. N, 2022).

Conclusion

Labyrinth games have significant potential to improve the concentration ability of children aged 5-6 years in kindergarten. Through challenging yet fun play mechanics, children can develop their cognitive skills in a supportive and interactive environment. The implementation of this game in the kindergarten curriculum can be an effective strategy in supporting children's mental development and concentration.

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