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The Effect of The Use of Traditional Congklak Games on Initial Numeracy Ability and Interest in Learning in Children Aged 5-6 Years

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Abstract: This study aims to find out (1) The effect of the use of traditional game congklak in on the ability to count early in children aged 5-6 years. (2) The effect of the use of traditional games on learning interest in children aged 5-6 years. (3) The significant influence of the use of traditional congklak games on early numeracy ability and interest in learning in children aged 5-6 years. This study is a quasy experiment study with a nonequivalent control group design, the population of this study is all group B children after 5-6 years at Kindergarten IT Uswatun Hasanah and Kindergarten Nur Rabbi Palembang, with a sample of 60 children. The instruments used were in the form of observation techniques for initial numeracy skills and learning interests of children aged 5-6 years. The data analysis technique used independent sample t-test analysis with a significance level of 0.05. The results of the study showed that: (1) There was a significant influence of the traditional game of congklak on the initial numeracy ability of children aged 5-6 years where the results of the paired sample t-test were obtained on average of 153.47 with a Sig value of 0.000 < 0.05. (2) There was a significant influence of traditional congklak games on the learning interest of children aged 5-6 years where the results of the paired sample t-test were obtained on average of 443.07 with a Sig value of 0.000 < 0.05. (3) There was a significant influence of traditional congklak games on the initial counting and learning interest of children aged 5-6 years where the test results of the t-test (Independent Sample Test) with a Sig value of 0.000 < 0.05. Based on the study, it can be concluded that there is a significant influence on the traditional game of congklak on the initial numeracy ability and interest in learning in children aged 5-6 years.

Keywords: Beginning Counting; Children; Congklak; Games; Interest in Learning

Introduction

Early childhood is a time when the child can do learning and playing activities (Munir et al., 2022), one of which is traditional games become a container for interesting forms of games for children to practice, including congklak. The traditional game of congklak is basically a game played by two children on one board by running congklak grains to collect as many seeds as possible in their own house. Whoever gets the most number of seeds will be the winner. The game of congklak is known throughout Indonesia but is known by different names. Congklak is a game played by two people with a board media made of wood or plastic which has 16 holes, where there are 2 main holes and 14 small holes. Before the game starts, the small holes are filled with 7 congklak seeds and an empty main hole. According to Hesti (2015) the benefits of congklak games are; (1) to accustom children to be patient and meticulous. When the opponent has to distribute congklak seeds, if the player is not careful and patient, the path of the game will not be smooth. (2) So that children can be fair (sportsmanship), because every game must have a loser and a winner, so that the attitude of accepting defeat is emphasized in every game. (3) Train analytical skills and student calculations. A good analysis strategy can be one of the supporting factors from a player to a winner, even if it only has one congklak (Gulz & Haake, 2024). Furthermore, there are advantages of the congklak game, including: (a) economical and practical; (b) learning

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while playing, so that children do not feel bored even though they repeat counting, even though they still stick to the initial goal, which is learning; (c) helping to develop children's creativity in terms of cognition, emotions and psychomotor children; (d) Fostering competitive attitudes and togetherness in group learning; (e) every 1 meeting, the child can understand the concept of multiplication (Matulessy & Muhid, 2022).

Menurut (Munir et al., 2022) suggests that children go through a series of stages of cognitive development that affect how they understand mathematical concepts. The preschool stage belongs to the pre-operational stage aged 2-7 years, where children begin to develop an understanding of symbols and numbers, although their thinking is still very concrete and often egocentric (Björklund, 2025). Initial counting is an activity that is carried out in order to find out the number or number of objects (Bianco et al., 2024). Counting is also an activity that connects objects (one-to-one correspondence) with the concept of numbers starting from anga one. (Lufthansa et al., 2024). Counting activities in early childhood can be interpreted as children's activities in recognizing or mentioning, sorting numbers and counting using numbers. Basically, counting has several concepts that are categorized into the ability to recognize numbers, numbers and their operations (Harwood et al., 2024). In addition, there are also several stages in counting, starting from the stage of understanding the concept, namely mastery with concrete objects, to the transition stage, which is the transition from concrete understanding to abstract understanding, then to the stage of recognizing the symbols of numbers given according to the development of the child. (Rachmah et al., 2021). Counting itself is defined as the science of numbers, the relationships between numbers, and the operational procedures used in solving problems regarding numbers (Putro et al., 2024).

Learning to count initially is one of the ways to train children's ability to think logically and systematically so that it can stimulate children's thinking skills so that they have readiness to learn mathematics at the next level, thus children can solve problems in daily life (Marifah, 2019). The ability to count unconsciously is used in daily activities, such as addition, division, subtraction, multiplication and fractions. Permendikbud No. 146 of 2014 concerning Early Childhood Education Standards, the program to improve numeracy skills from 1-20 in group B children which can be used as a reference for teachers in preparing learning implementation plans, learning activity development materials, formulated and defined in the level of achievement of numeracy indicators in group B children (age 5-6 years) as follows: 1) Counting number symbols from 1-20, i.e. counting or mentioning the sequence of numbers 1-20 and showing the number symbols from 1-20; 2) get to know various kinds of number symbols, namely calculating the order of number symbols 1-20 and mentioning the result of adding from 1-20 to match the number with the number symbol then the child can match the number mentioned with the number symbol listed on the object (Wati Sukmawati ,2017). Early childhood in starting counting is very important because this beginning counting is the basis for children to learn to count which will be useful for their lives in the future (Lê et al., 2024).

Play activities that give children the opportunity to interact with their friends and environment are a priority (Sutopo & Munir, 2023). In addition, because children are unique individuals and are very varied and varied (Bird et al., 2024). Early childhood counting can actually be done by inviting children to learn through play while learning where learning is carried out to children in a fun, active and free way (Schiele et al., 2025). Free means not based on other people's orders or targets and has the freedom to do activities that he likes through play. In accordance with the characteristics of early childhood who are active in carrying out various explorations of their environment, play activities are part of the learning process. Starting counting children must go through several stages, namely being able to recognize numbers, mention numbers, and sort numbers and finally children are able to do the beginning counting correctly.

Based on several expert opinions, it can be concluded that children call the sequence of numbers without mentioning concrete objects. Children aged 4-5 years have been able to name the number sequence up to ten, while children aged 5-6 years can name numbers up to 1-20 or more. But in reality in the field that there are some children who have difficulty participating in learning, this is because the child is a transfer student from another area and the age of the child has not yet entered the age of five years and there are also some children who are still not fixed in sorting the numbers 1-20, matching objects according to the symbol of numbers, counting the number that exists, Therefore, this child still needs guidance and assistance from teachers, especially numeracy skills. As well as teacher media that is less attractive and monotonous because it only uses a blackboard. Therefore, researchers want to foster interest in learning so that children can carry out the learning process properly. Learning activities that can develop counting at the age of 5-6 years are counting the number of objects present, matching objects with number symbols, counting and reducing the use of learning media, sorting numbers from a few to many or vice versa, with the activities provided by the researcher can see the numeracy skills possessed by children.

Interest in learning is a situation where students pay attention to learning accompanied by a desire to know and learn a learning until they enter the phase of wanting to create and prove more in learning (Prayuga, 2019). Based on some of the opinions of the experts above, it can be concluded that interest in learning is an inner

inclination such as the feeling that children are happy with something, then children will continue to do what they like, interest is related to mobility, namely children tend to get closer to what they are interested in, children's attention when interest has arisen, children will tend to focus more quickly or focus on something they are interested in and children's involvement in conditions that cause children to be happy and interested in carrying out activities that interest him. In reality, children lack interest in learning because students move from other areas and the age of children who have not yet entered the age of five years and there are also some children who are still confused and the media used is too monotonous such as a blackboard, therefore children still need guidance and assistance to grow children's interest in learning

Method

This study is a type of Quasy Experiment research where the researcher does not rendomize in determining the subject of the research group. The design in this study is a pre test - post test group design, where this form design uses comparison. The grouping was not carried out randomly and pre-test and post-test were held. The two groups were given treatment and then a comparison was made between the results of the pre-test and post-test to see the difference in the results of the treatment given. The research design design is in the table below.

Tabel 1. Research Design

O_1	**X**	**O_2**
O_3	-	O_4

Information:

O_1	:	Pre-test of the experimental class
O_2	:	Post-test of the experimental class
O_3	:	Control class pre-test
O_4	:	Post-test control class
X	:	Treatment in the experimental class using the traditional game congklak
-	:	Not given the same treatment as the experimental class

The population in this study amounted to 60 subjects which were divided into 30 subjects at Kindergarten IT Uswatun Hasanah Palembang, and 30 subjects at Nur Rabbi Kindergarten Palembang. And the basic sampling technique uses the total sampling technique. So that the sample in this study amounted to 60 subjects which would be divided into 15 control groups and 15 experimental groups in each population. The research data collection technique uses observation and documentation. The data collection instruments in this study used questionnaires that had been validated by validators using the Likert scale and the data analysis techniques in this study used Uj Prerequisites, including normality and homogeneity tests. And after the prerequisite test was carried out, a hypothesis test was given using the Palired Salmple t-test and the Independent Salmple t-test to find out the difference in each variable.

Result and Discussion

The data in this study were obtained through the pretest and posttest stages conducted by the researcher. The data obtained included initial numeracy skills and learning interests from existing samples, namely class B of Kindergarten IT Usswatun Halsanah and Nur Rabbi Kindergarten Palembang. The results of the data are in the Table 2.

1. Normality Test

The normality test using the traditional game of congklak of children's discovery, data of initial numeracy ability and interest in learning at the age of 5 to 6 years was tested by the correction of the significance of Lilliefors from Kolmogorov-Smirnov against the significance level (α) of 0.05. H0 indicates that the sample came from a population with a normal distribution. Data on children's initial numeracy ability and learning interest were calculated by computer using the statistical release of SPSS 26 in learning activities that used initial numeracy and children's learning interest were presented with Table 2.

Table 2. Normality Test

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statisticc	df	Sig.	Statistic	df	Sig.
Pre Test Traditional Game Congklak Experimental Class	.188	15	.160	.943	15	.424
Post Test Traditional Game Congklak Experimental Class	.197	15	.120	.905	15	.115
Pre Test Numeracy Ability at the Beginning of the Experimental Class	.197	15	.122	.878	15	.044
Post Test Numeracy Ability at the Beginning of the Experimental Class	.086	15	.200*	.973	15	.897
Pre Test Interest in Learning Experimental Classes	.139	15	.200*	.914	15	.154
Post Test Interest in Learning Experimental Classes	.201	15	.106	.872	15	.036
Pre Test Traditional Game Congklak Control Class	.135	15	.200*	.967	15	.819
Post Test Traditional Game Congklak Control Class	.172	15	.200*	.912	15	.147
Pre Test Control Class Beginning Nuemeracy	.126	15	.200*	.946	15	.461

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statisticc	df	Sig.	Statistic	df	Sig.
Post Test Control Class Beginning Nuemeracy	.185	15	.178	.896	15	.084
Pre Test Control Class Learning Interest	.188	15	.159	.886	15	.058
Post Test Control Class Learning Interest	.180	15	.200*	.908	15	.125

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

Based on the table above, it can be seen that the value of sig. (2-talíled) of 0.160, 0.120, 0.122, 0.200, 0.200, 0.106, 0.200, 0.200, 0.200, 0.178, and 0.159, 0.200, and 0.200 greater than the significance level of 0.005. So it can be concluded that the data presented is normally distributed.

2. *Homogeneity Test*

The homogeneity test was carried out on the data on the initial numeracy ability and learning interest of children aged 5 to 6 years who received treatment using the traditional game congklak. The homogeneity test aims to determine whether two or more groups of sample data come from populations that have similar variants. The decision in the homogeneity test depends on the significance value (Sig), where if the value is greater than 0.05, then the variant is considered homogeneous. The following are the results of the homogeneity test using the Levene statistical tes.

Table 3. Uji Homogeneity Test

		Levene Statistic	df1	df2	Sig.
Student Learning Outcomes	Based on Mean	.589	5	84	.708
	Based on Median	.366	5	84	.871
	Based on Median and with adjusted df	.366	5	71.261	.870
	Based on trimmed mean	.566	5	84	.726

Based on the table above, it is known that the data of the five indicators, namely the post test of the traditional game Congklak of the experimental class, the post test of the arithmetic ability of the experimental class, the learning interest of the experimental class, the post test of the traditional game of the control class, the post test of the arithmetic ability of the control class and the learning interest of the control class are > of 0.05 so that the five data have the same or homogeneous variance of the group.

3. *Hypothesis Test*

Hypothesis testing aims to see or prove whether the hypothesis is accepted or rejected. The following is an explanation of the results of the study to find out if there is a significant influence on the results of the data obtained.

1) *There is a significant influence of the palired salmple t-test on Initial Numeracy Ability*

Table 4. Paired Sample Test t-test Beginning Numeracy Ability Control Class

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre Test Numeracy Ability Beginning Control Class	105.13	15	20.681	5.340
	Post Test Numeracy Ability Beginning Control Class	144.20	15	23.614	6.097

Based on the table above, the results of the paired sample statistics in the table above show that the post test value of the control class's initial numeracy ability is higher than the pretest value. The average pretest score in the control class was 105.13 while the posttest score was 144.20. There it can be seen that there is an increase of 39.07.

Table 5. Paired Sample Test t-test Numeracy Ability Beginning Experimental Class

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre Test Numeracy Ability at the Beginning of the Experimental Class	114.20	15	27.677	7.146
	Post Test Numeracy Ability at the Beginning of the Experimental Class	153.47	15	10.535	2.720

Based on the table above, the results of the paired sample statistics in the table above show the value of the ability post test Based on the table above, it shows that the value of the posttest ability at the beginning of the Experiment class is higher than the pretest value. The average pretest score in the experimental class was 114.20 while the posttest score was 153.47. There it can be seen that there is an increase of 39.27.

2) *There is a Significant Effect of Palired sample t-test on Learning Interest*

Table 6. Paired Samples t-test Control Class Learning Interest Test

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre Test of Control Learning Interest	257.07	15	107.731	27.816
	Post Test of Control Learning Interest	343.07	15	84.251	21.753

Based on the table above, the paired results of the staltistics sample showed that the posttest value of the initial numeracy ability of the control class was higher than the pretest value. The average score of the pretest in the control class was 257.07 while the posttest score was 343.07. There it can be seen that there is an increase of 86.00.

Table 7. Test t paired sample t-test Experimental Class Learning Interest

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre Test Interest in Learning Experimental Classes	204.00	15	45.226	11.677
	Post Test Interest in Learning Experimental Classes	367.60	15	72.663	18.762

Based on the table above, the results of the paired staltistics sample showed that the posttest value of the learning interest in the Experiment class was higher than the pretest score. The average pretest score in the experimental class was 204.00 and the posttest score was 367.60. There it can be seen that there is an increase of 163.60.

3) *There is a Significant Effect of the t-Test (Independent Sample Test) on Initial Calculation and Learning Interest*

Table 8. Independent Sample Test Traditional Game Congklak against Beginning Numeracy Ability of Experimental Class and Control Class

	Class	N	Mean	Std. Deviation	Std. Error Mean
Student Learning Outcomes	Post Test Traditional Game Congklak Experiment and Control	30	216.60	71.795	13.108
	Post Test of Numeracy Ability at the Beginning of Experimental and Control Classes	30	251.03	14.207	2.594

Based on the table above, it is known that the average score of the posttest in the table above shows that the average score of the Post test of the Traditional Game of Congklak is higher than the post test of the beginning of the experimental class and the control class. In the Post test of the Congklak Traditional Game, the average posttest score was 216.60, and in the Post test of the calculation ability at the beginning of the experimental class and the control class, the average posttest score was 251.03. This means that there is a difference in the average score in the two classes of 34.43. So in other words, there is a significant influence on the use of traditional congklak games on the beginning of counting for children aged 5-6 years in group B at Kindergarten IT Uswatun Hasanah and Nur Rabbi Kindergarten, Ilir Barat District 1 Kotal, Palembang, South Sumatra Province.

Table 9. Independent Sample Test of Traditional Congklak Games on Learning Interest in Experimental Classes and Control Classes

	Class	N	Mean	Std. Deviation	Std. Error Mean
Student Learning Outcomes	Post test Permainan Tradisional Congklak eksperimen dan kontrol	30	216.60	71.795	13.108
	Post test minat belajar kelas eksperimen dan control	30	399.83	63.540	11.601

Based on the table above, it is known that the average score of the posttest in the table above shows that the average score of the Post test of the Traditional Game of Congklak is higher than the Post test of the learning interest of the experimental and control classes. In the Post test of the Congklak Traditional Game, the average posttest score was 216.60, and in the Post test of the learning interest of the experimental class and the control class, the average posttest score was 399.83. This means that there is a difference in the average score in the two classes of 183.23. So in other words, there is a significant influence on the use of traditional congklak games on the learning interest of children aged 5-6 years in group B at Kindergarten IT Uswatun Hasanah and Kindergarten Nur Rabbi, Ilir Barat District 1 Kotal Palembang, South Sumatra Province.

Discussion

Traditional congklak games have several advantages, including 1) they do not cost much, 2) increase children's creativity, 3) they develop children's social and emotional intelligence, 4) children get to know nature more, 5) they help to teach values, 6) they develop children's fine and gross motor skills, 7) improve children's health in terms of physical and mental stamina, 8) they optimize children's cognitive abilities, 9) they create an atmosphere of enjoyment, 10) they can be used with children of different ages, 11) they can help develop a sense of art and beauty. In line with the research, namely research (Murugiah et al., 2023) that there was an increase in the ability to recognize the concept of the number symbol 1-10 before and after the implementation of the congklak modification game activity in children aged 5 - 6 years. According to (Kable et al., 2024) In learning to count for children aged 5-6 years, it is important to start with concrete (enalctic) experiences such as counting physical objects, then moving on to image representations (iconic), and finally using numerical symbols (symbolic). It can be concluded that counting grains (marbles or seeds) counts total, the child must count the total grains in each hole. This helps them in basic calculations. Counting movements, during play, the child must count the number of items taken and place them one by one into each hole. It involves understanding the amount and subtraction. The congklak game is not only fun but also has significant educational potential (Tay et al., 2024). By integrating elements of calculation, strategy, and concentration, congklak helps children develop their numeracy skills naturally. Therefore, traditional games such as congklak can be an effective tool to support mathematics education at an early age.

The use of these games can improve children's learning abilities and interests, as well as help them understand basic concepts in a more fun way (Inan et al., 2024). According to (Maker et al., 2023) revealed that children are active learners who build their own knowledge through interaction with the environment. An interest in learning is fostered by providing them with opportunities for exploration and experimentation (Möhring et al., 2024). The use of traditional games such as congklak can have a significant positive influence on children's interest in learning. This game, with all its uniqueness and complexity, offers a variety of educational and psychological benefits that can increase children's engagement and motivation in the learning process (Foldager et al., 2024). Interest in learning is a psychological aspect of a person that manifests itself in several symptoms, such as passion, desire, and a feeling of liking to carry out a new process of behavior change as a whole, as a result of his own experience in interaction with his environment (Williams et al., 2023).

Traditional games that combine elements of cognitive and social learning can increase children's interest in learning (Sakaue et al., 2023). Congklak, for example, helps children develop numeracy skills and strategies, as well as foster an interest in learning through fun interactions with peers. According to (Chen et al., 2024) found that congklak games can increase learning interest and numeracy skills in children aged 5-6 years. Children who play congklak show more interest and enthusiasm in learning, as well as an improvement in basic numeracy skills. Traditional games help children to be skilled and cooperate with their peers (Peltokorpi et al., 2024) with traditional congklak games that can also foster children's enthusiasm and cooperation in interacting (Pulkkinen et al., 2022) . Traditional games themselves contain a lot of good things which include movement, skills, creativity, and brain training that can improve the ability to compete, togetherness, sophistication, honesty, and mutual respect (Carew et al., 2024).

Conclusions

Based on the results of the above study, it can be concluded that the use of traditional congklak games has a significant positive impact on the initial numeracy ability and learning interest of children aged 5-6 years. By providing a fun and interactive learning context, congklak helps to strengthen basic math skills and increase children's motivation and interest in learning. These games not only develop cognitive abilities but also social and emotional skills, making them a holistic and effective educational tool. So the implications of this study refer to the provision of education to educators so that they can have superior creativity and innovation in the teaching and learning process.

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Author Contributions

Each author contributes in some way to the completion of this research activity. The main author provides basic ideas and provides research materials and the second, third, fourth authors design research methods and furthermore, all authors share responsibility for data collection, data tabulation and analysis, review process, and article writing.

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Conflicts of Interest

Regarding this study, the author declares that there is no conflict of interest**.**

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