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Utilization of ULTIF games to improve cognitive abilities of children aged 5-6 years

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Abstract

It is important for educators and parents to understand children's cognitive development using a needs-based approach that will help ensure children have the opportunity to develop optimally throug stimulation. Proper stimulation can help children develop optimally. The purpose of this study was to determine the benefits of ULTIF games to improve children's cognitive abilities. The research method used was experimental research. Data collection using documentation, performance tests and participatory observations analyzed using the t test. The pre-test score was 2.03 and the post-test score was 2.48 so that there was an increase in children's cognitive development to develop very well. The results of the data analysis showed that the t-count value of 23 was greater than the t-table of 1.76 with a significance level of 0.05 with N = 15. This proves that the working hypothesis (H) which states that there is an effect of ULTIF games on the cognitive abilities of children aged 5-6 years.

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INTRODUCTION

Early childhood is a stage in the golden age that is very important in child development, specifically children need more direct attention when compared to other levels of education (Suhendro: 2020). During this period, early childhood is still very dependent on the care, guidance, and support of adults, especially parents or caregivers, to meet the child's physical and emotional needs. The environment around the child has an impact on the child's development. It is important to provide a supportive environment, appropriate stimuli, and positive interactions during this period. Therefore, services provided to early childhood are recommended to be more specific and direct, because this period is the foundation for further development that can be applied by parents and teachers to children's education.

The education that children undergo in the early stages of learning cannot be separated from the concept of playing while learning. This is in accordance with the opinion of Fadlillah (2018: 11) who explains that playing is very important for children because through these activities children experience a learning process. Therefore, in designing the right learning process, educational game tools (APE) are needed which have benefits such as providing pleasure to children because of the element of play in the learning process that children receive from the APE.

The benefits of educational games can provide a fun learning experience by stimulating various aspects of development, namely cognitive development, physical-motor development, language development, social-emotional development, religious and moral value development, and art development (Suryana: 2018). Every aspect of child development is interrelated and supports children's education, but cognitive abilities are more emphasized because cognitive abilities have an important role in the learning process, including learning by exploring the environment, interacting with others, and experimenting with new ideas, so cognitive abilities are very much needed. This is in accordance with the opinion of (Ardiana: 2022) who says that children will always learn wherever they are, so the right education is needed for cognitive abilities.

According to Novitasari (2018), cognitive is a child's ability to think more complexly and use reasoning and problem solving, increasing cognitive abilities will make it easier for children to master broad learning. According to Rohim, et al. (2021) to measure cognitive abilities, the main ones measured are literacy and numeracy abilities. Based on the opinion above, it is concluded that cognitive abilities are reasoning abilities in problem solving, literacy abilities such as letter recognition, and numeracy abilities, namely number recognition.

Using an approach to each child's ability needs will help ensure that children have an equal opportunity to develop optimally through stimulation. Stimulation is an important part of children's basic needs to hone their abilities. Through appropriate and continuous stimulation, children will have the opportunity to develop optimally in various aspects of development compared to children who lack stimulation. Exercise and play are two effective ways to provide stimulation to children (Kristina: 2021). Stimulation of developmental aspects can be done in various ways, namely the use of APE, for example the snakes and ladders game. According to Wati (2021), the snakes and ladders game is a game played by 2 or more people using dice and there are boxes and pictures of ladders and snakes. In this game, children are invited to do and find for themselves the learning outcomes that will be achieved so that they actively learn.

The use of educational snakes and ladders games can be an effective alternative in improving the cognitive abilities of children aged 5-6 years. This game is not only entertaining, but can also train children's thinking, strategy, and concentration skills. By stimulating various aspects of cognitive development, the game can help with number recognition. The snakes and ladders game is a game played by three or more players which consists of boxes marked with numbers or pictures, and there are snakes and ladders connecting the boxes. Each box contains questions that include questions that improve children's cognitive literacy and numeracy. In addition, this game is not only for entertainment, but has educational value because children are invited to actively learn and find learning outcomes through the playing process. This helps strengthen children's understanding of numbers in the context of a fun game. In addition to recognizing numbers, children can also help with letter recognition because they will consistently see and mention letters when they play the

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snakes and ladders game. Children do the repetition exercises needed to remember and recognize letters better. When children step on the game board, they not only focus on the numbers but also on the letters they encounter throughout the game. This process facilitates letter learning in a fun context. For example, when a child lands on a certain square, the child is asked to name the letter on the square or answer a question related to the letter. This is in line with the educational goal of not only entertaining but also developing cognitive abilities.

Based on the results of a preliminary study conducted by researchers in April 2024 at Pejajaran Kindergarten Surabaya, it showed that 10 out of 15 children tended to have difficulty in reading, detecting instructions and recognizing numbers. Then the researchers also did not find any Cognitive APE that supports children's learning related to children's literacy and numeracy, for example the snakes and ladders game. Based on the problems above, an appropriate APE is needed, in this case the researcher used snakes and ladders that were modified according to the needs of the school. The APE is called the educational snakes and ladders game (ULTIF).

ULTIF is a modified snakes and ladders game in the form of boxes containing questions about literacy and numeracy. This game is played by three or more players combined with the image of a snake as a symbol for going down from one box to another box and a ladder as a symbol of going up as the quickest shortcut to the last box which makes children enthusiastic about counting towards the stairs. Apart from that, ULTIF has arrows that will train children to see instructions for the direction of the box which is designed in bright colors and can attract children's attention. Through the ULTIF game, it is hoped that it can improve the cognitive abilities of children aged 5-6 years.

METHOD

The research used is experimental research with a pre-experimental design in the form of One-Group Pretest-Postest Design. According to Jaya (2020) experimental research is a quantitative research used to determine the effect of independent variables on dependent variables in controlled conditions. This research is quantitative with 8 studies, which were carried out 8 times pretest (before treatment) treatment and post-test (after treatment) at each meeting. The application of the ULTIF game as an effort to improve the cognitive abilities of group B children totaling 15 children took part in the learning process while playing. Initial observations and observations after implementing the ULTIF game were carried out tok etermine the effect of the ULTIF game in overcoming the problems of early childhood, namely the low cognitive abilities of children.

The data collection method is a way used by a researcher to reveal or collect quantitative information from respondents according to the scope of the study. Data collection techniques using participatory observation, documentation, and performance tests. The instrument used in this study is to determine the development of cognitive abilities. Observation of children's cognitive abilities by giving a checklist (✓) in the column that corresponds to the child's behavior, after which analyzing the data as an effort to obtain available data, then processed with parametric statistics and can be used to answer the formulation of the problem in the study. The criteria for the research instrument are if it develops very well, give a checklist on number 4, develop according to expectations, give a checklist on number 3. start to develop, give a checklist on number 2. and have not developed, give a checklist on number 1. Before starting a study using an observation sheet, researchers should make a draft of the instrument so that researchers have a clear picture. Table 1 is the points of the draft instrument taken from several theoretical studies and regulations of the Minister of Education and Culture Number 137 of 2014 and 146, the following is a draft of the instrument table for cognitive abilities of children in group B.

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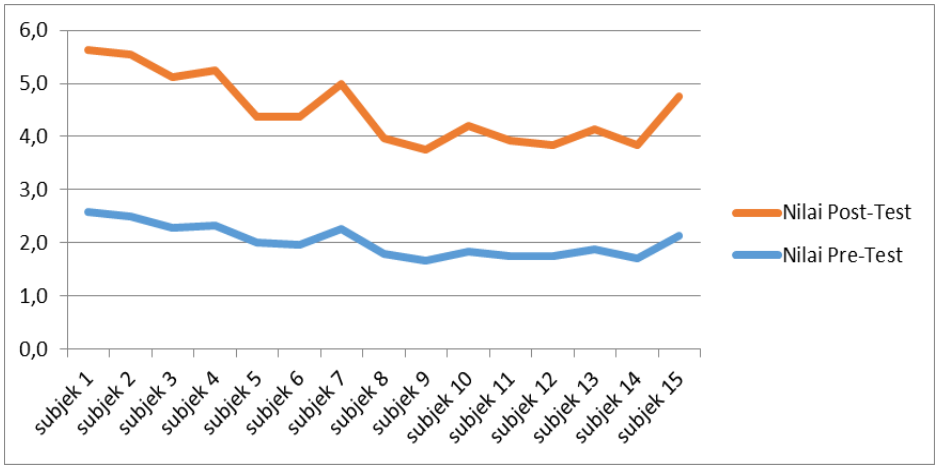
Table 1. Grid of the instrument for the influence of the ULTIF game on the cognitive abilities of children in group B.

No	Indicator	Item Kode
1.	Able to detect instructions or clues	1
2.	Able to display reading skills	2
3.	Able to read number symbols to calculate	3
	Total instrument items	3

RESULTS AND DISCUSSION

Result

The implementation in this study was carried out every day of pre-test assessment (before treatment) with treatment and post-test (after treatment). Data collection and presentation, namely Pre-test and Post-test, were presented in the form of a table which was then tested for hypotheses, then looking for the results of the significance of the table and t count which were carried out with a total of 15 children. The results of the calculation and differences between the pre-test and post-test are presented in the form of graph 1.



Graph 1. Average Results of Pre-test and Post-test

It can be seen from graph 1 that there is a development from the first day to the eighth day of the study, the results that increased rapidly can be seen in subject seven who gave a good response and satisfactory results, then in subjects fifteen and three had a significant increase the same as subject seven according to the purpose of this study. After getting the pre-test and post-test results, the next step is to test the hypothesis using statistical analysis of the t-test getting a result of 23.

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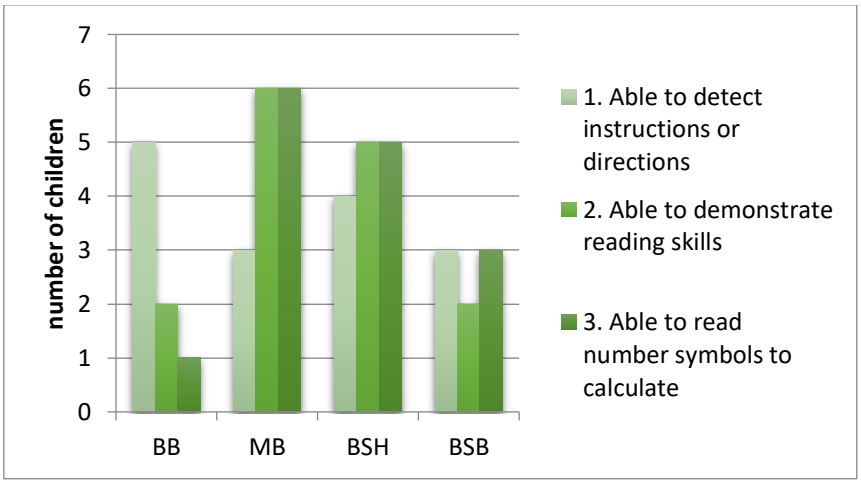
Table 2. Hypothesis test results

Hypothesis	Signification	t_{count}	t_{table}	H_0	H_1
The Influence of "ULTIF Games on the Cognitive Development of Children Aged 5-6 Years".	5% db = N-1 =15-1 =14	23	1,76	Rejected	Accepted

It can be seen from graph 1 that there is a development from the first day to the eighth day of the study, the results that increased rapidly can be seen in subject seven who gave a good response and satisfactory results, then in subjects fifteen and three had a significant increase the same as subject seven according to the purpose of this study. After getting the pre-test and post-test results, the next step is to test the hypothesis using statistical analysis of the t-test getting a result of 23.



Grafik 2. Cognitive Development Achievements in Children Aged 5-6 Years Indicators

Based on the graph above shows the average value of cognitive development achievement at the age of 5-6 years after being given treatment (Treatment) using ULTIF media, showing the average post-test value is at the development achievement (MB), which is starting to develop in children aged 5-6 years. Descriptive statistics show the average cognitive ability score before the study (pre-test) 2.3 with a standard deviation of 0.29. After being given the ULTIF game (post-test), the cognitive ability increased with an average value of 2.48 with a standard deviation of 0.35.

Discussion

Fun learning can be obtained from the snakes and ladders game, so that they tend to be interested in following the learning process and show an increase in learning in children. This is in accordance with that applied by Istiqomah (2018) who studied group B students totaling 12 children consisting of 8 boys and 4 girls who had passed the results of cycle I and cycle II actions which resulted in an increase in arithmetic skills in group B students, indicating that there is an increase in learning in children when using the snakes and ladders game, therefore the researcher uses the snakes and ladders game which will be modified according to research needs. Furthermore, the results of the study (Prihatini and Musrid: 2022) show that the giant snakes

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and ladders game can improve children's cognitive abilities, such as number recognition, problem solving, understanding concepts and implementation of the giant snakes and ladders game can develop the cognitive abilities of group B children, in addition (Masridi and Agustin: 2024) got the results that children gain additional knowledge from the snakes and ladders game and improve children's abilities in literacy and numeracy which attract attention.

From the explanation above, the snake and ladder game has proven to be an effective tool in developing various cognitive aspects and in children's literacy and numeracy skills, therefore the researcher aims to create a game tool that includes the research above that can improve cognitive in the form of fun learning. The following is a game tool design that is made according to the needs of children that have been adjusted during the preliminary study.

CONCLUSION

Based on the formulation of the problem and the purpose of the study which is strengthened by the results of data analysis shows that the t-value of 23 is greater than the t-table of 1.76 with a significance level of 0.05 with N 15 which means that the null hypothesis (Ho) is rejected and the working hypothesis (H1) is accepted. It is concluded that the working hypothesis (H) which states "there are benefits of ULTIF games on the cognitive abilities of children aged 5-6 years.

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