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Maze Games to Develop Early Children's Hots (Higher Thinking Order Skills)

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Abstract

HOTS ability is needed by early childhood . The challenge of the Indonesian nation in facing the industrial revolution 4.0 is to prepare superior human resources so that as early as possible children are accustomed to being able to develop their cognitive abilities. One of the important cognitive abilities is the ability to think at a higher level that can be given to early childhood . In this case learning using game media is suitable in developing children's thinking skills, especially high-level thinking skills. This study aims to determine whether the use of maze games can develop higher thinking order skills in early childhood . This study uses a quantitative method with an experimental design type one group pretest posttest design. The sample used is 17 respondents. The technique of collecting data is through a questionnaire/questionnaire. The results showed that the maze game can develop high-order thinking skills in early childhood . This can be seen from the results of descriptive analysis with 17 respondents. The average pretest result in the group shows a value of 78.41 The average posttest result was 92.47.

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INTRODUCTION

Every child has development at their age level, early childhood is the right age to be able to maximize every development, one of which is cognitive development that can be developed with various stimuli at school and at home. According to (Wilis, 1989) learning is a process in which individuals or organizations change behavior based on experience, learning emerges from experience with the environment in which there is a relationship between stimuli and responses. Learning creates experiences that are obtained after experiencing the learning process, and in learning there are bonds that exist between individuals and individuals, individuals and groups, or individuals and their environment.

According to Anggraeni, Arvyaty, & Salim in (Anggalomoare, 2018) , the development of cognitive abilities aims to increase children's thinking abilities. In these cognitive abilities, children's learning activities are organized in an integrated manner through learning themes that are closest to the context of the child's life, starting from the child waking up until the child wants to go back to sleep. All aspects that are close to children make it easier for children to receive important information that will be useful for children's lives in the future. This higher-order thinking ability requires a person to apply new information or previous knowledge and add information to find possible answers in new situations, such as new information about green and small and medium-sized oranges from the teacher at school, when they get home the child knows there is more new information about citrus fruits that turn out to be large and named grapefruit, the child will add this information to the information that the child knew before at school. In accordance with Piaget's theory (Ginting, 2018) states that children actively use schemas or frames of reference in understanding their world. A schema can be defined as a pre-existing framework in a person's mind that is used to organize and interpret information.

Thinking skills are skills that involve mental activity in choosing the right technique or method, used both in principle and for facts and procedures, to gain knowledge, solve and solve problems (Purnamasari et al., 2020) . According to Satra in (Wibawa & Agustina, 2019) higher-order thinking skills are students' thinking processes at a higher cognitive level developed from various cognitive concepts and methods and learning taxonomies such as problem solving methods, Bloom's taxonomy and learning, teaching and assessment taxonomies. These higher-order thinking skills include problem-solving skills, creative thinking skills, critical thinking, reasoning skills, and decision-making skills.

Higher Order Thinking Skills (HOTS) or higher order thinking skills are levels of cognitive thinking from the lowest level to the highest level in Bloom's Taxonomy. HOT Skills was first introduced in 1990 and has undergone changes since then. This change is seen so that the HOT Skills theory is more in line with the development of education in the 21st century. The concept of HOT Skills includes the concepts of remembering, understanding, applying, analyzing, evaluating, and creating. The development of this concept is based on the nature of children who are more inclined to have strong memory and thinking power.

HOTS ability is needed by early childhood . The industrial revolution 4.0 is one of the factors that early childhood at this time must have various skills that can support their lives in the future, for example, such as early childhood who are accustomed to using their cognitive skills in the future, it will be easier to solve problems flexibly, practical and socially acceptable. With the HOTS , it is hoped that early childhood can get used to their thinking skills and can use their thinking skills in everyday life. According to Newman and Wehlage in (Dinni, 2018) with higher order thinking, students can clearly distinguish ideas or ideas, argue well, solve problems, build explanations, make hypotheses, and understand complex things more clearly. According to the Revised Bloom Theory in (Nugroho, 2021) explains several levels contained in HOTS, namely the ability or skills of students to analyze (*analyze*), evaluate (*evaluate*), and create (*create*). Coupled with the opinion of *The Partnership for 21st Century Skills* (*Parthership* for 21st Century Skills: Framework for 21st Century Learning, 2019) explain the academic content in the form of 3Rs (*Arithmetic, Reading, Writing*) and 4Cs (collaboration, creativity-innovation, critical thinking and problem solving, and communication) which underlie higher order thinking skills.

One of the learning models that can be used in developing *Higher Thinking Order Skills* for early childhood is the *Problem Based Learning learning model* , from research conducted by UNPAM students in a journal entitled *Broblem based learning application learning model* in early childhood (Sugiyanto & Ramang, 2021).) , the respondents consisted of principals and teachers, qualitative data collection techniques were carried out through questionnaires, interviews, observation

notes, taking photos and videos, the data taken in the form of knowledge of school principals and teachers regarding *problem based learning* in early childhood. The results of the study stated that before being given an explanation as many as 2.17% of respondents stated they understood, 22.50% of respondents said they did not understand, 27.50% of respondents said they did not understand, 47.83% did not understand very well. The available data shows that there is a lack of knowledge about problem based learning models in early childhood which can develop *higher thinking order skills* in early childhood. While problem-based learning is a learning strategy that involves students in solving problems individually or in groups by involving various disciplines. Problem-based learning can also use real media and can make learning more fun, build communication skills, collaborate and apply learning that allows students to think critically in solving problems.

Cognitive development is the process of growth and development of children's intelligence that can think more complexly related to how individuals learn, pay attention, observe, imagine, estimate, assess and think about their environment. According to Arsyad in (Kuswanto, 2020) , in order for cognitive development to develop optimally, learning in kindergarten should be able to develop all aspects of child development. By using interesting learning media and reducing monotonous learning, children will feel happy about the learning provided. In an effort to improve cognitive skills, especially in high-order thinking skills in children in this study using learning media in the form of maze games. According to Henry in (Angela & Gani, 2016) maze is a game with a twisting road network with obstacles. so that this game can improve students' understanding to find out the location, space and path in the maze game , while according to Safira and Fidesrinur in (Saptiwi & Lestariningrum, 2021) Maze is a game that emphasizes strategy training to find a way out. The benefits of maze according to Yulistari in (Kuswanto, 2020) are patience, practice grouping skills , find solutions and learn shapes and colors, train fine motor skills , train logical thinking , train children's hands to be flexible.

At the beginning of 2020, Indonesia experienced a pandemic that quite disrupted the world of education, not only in Indonesia, this pandemic also exists throughout the world, the first case of COVID-19 was detected in Wuhan, China in December 2019 and spread rapidly throughout the world due to the spread of the pandemic. It's very fast just by air. In Indonesia, this pandemic emerged in early March 2020 and since then all activities related to physical contact between humans have been stopped, including schools, all activities in schools have been stopped and replaced with distance learning. With this pandemic, children cannot meet friends and teachers face-to-face and are replaced by learning from home, the impact of the covid-19 pandemic makes children bored studying at home because of the lack of game media in learning.

In the current pandemic era, education also needs to be improved so that children can learn as well as possible, even though learning is only at home or often referred to as learning from home, the media used by children must be able to improve their development such as media that can develop higher-order thinking skills. in children, but the problem is it is still difficult to get the right media to develop higher order thinking skills in early childhood.

Based on observations made by researchers at early childhood institutions in Tegal Regency, the media used for distance learning (PJJ) is by using gadgets and using the *Whatsapp mobile application* . Learning is only in the form of tasks that must be done by children such as writing assignments, coloring pictures, counting, singing and so on. Citing data from Wahana Visi Indonesia related to the impact *of Covid-* 19 and its effects on children, as many as 47% of children feel bored at home, 35% of children are worried about missing lessons, 15% of children feel insecure, 34% of children are afraid of getting sick. including the covid virus, 11% of children experienced physical violence and 62% of children experienced verbal violence (Wahana Visi Indonesia, 2021) . It takes the cooperation of all parties to prevent the psychosocial impact on children during the *Covid-19 pandemic,* especially support from parents.

In Tegal Regency, especially in Pengabean Village, there is Aisyiyah Bustanul Athfal Kindergarten. Aisyiyah Bustanul Athfal Kindergarten during the *new normal pandemic,* learning is carried out offline by following strict health protocols. To restore a child's desire to learn and enthusiasm for learning that decreases when learning from home, the use of game media in learning is very important, one of the learning media that can be used is the maze game. Through the maze game, it is hoped that children can develop *higher order thinking skills* , in this game there are several stages of the game that can develop children's higher thinking order skills, and can be followed by children aged 5-6 years or kindergarten class B. Based on the description above, the researcher interested in doing research on Maze Games to

develop HOTS (*higher thinking order skills*).

The aim of this research is to find out whether the maze game can develop higher *order thinking skills in* early childhood . In this study, researchers used interesting game media in the form of maze games, maze games were used to develop higher order thinking skills (HOTS).

RESEARCH METHODOLOGY

The research method used in this research is quantitative by using a research design with an *experimental design* type *one group pretest posttest design* . There are two variables in this study, namely the maze game as the independent variable and higher order thinking skills as the dependent variable. The population in the study were all students of Kindergarten A isyiyah Bustanul Athfal Pengabean Class B , which consists of 17 students for the 2021/2022 academic year. While taking the sample using total sampling, namely the total number of members of the population into a sample of 17 respondents .

The technique of collecting data is through a questionnaire/questionnaire. The research instrument uses a Likert scale . Validity test is done by using content validity. Testing the reliability of the research using the *Product Moment formula* . Meanwhile, the data analysis technique was carried out by means of normality test, hypothesis testing and N Gain test .

RESULTS AND DISCUSSION

Descriptive results aim to describe the data that is processed in such a way that the data provided is easier to read, so how much the development of high-order thinking skills in early childhood with maze games can be understood easily.

Table 1. Results of Descriptive Data Analysis

Statistics	Experiment Class	
	Pretest	Posttest
Maximum	92	109
Minimum	62	78
Range	30	31
Average	78.41	92.47

Based on the statistical table above, it is known that the statistical data from 17 students in the *pretest experimental group* showed that the average *pretest score* of the respondents was 78.41, the maximum value was 92 and the minimum value was 62, the *range value* was 30. While the *posttest experimental group data* showed that the *posttest* average value is 92.47, the maximum value is 109 , the minimum value is 78, and the *range value* is 31.

Table 2. *Pretest* Results

Class interval	Frequency	Percentage	Category
37 - 57	0	0%	Very low
58 - 78	9	53%	Low
79 - 99	8	47%	Tall
100 - 120	0	0%	Very high

The table above shows the results of the *pretest* on high-level thinking skills of early childhood conducted by researchers in the experimental group, the results show that there are 9 children or 53% in the low category and there are 8 children or 47% in the high category.

Table 3. *Posttest* Results

Class interval	Frequency	Percentage	Category
37 - 57	0	0%	Very low
58 - 78	1	6%	Low
79 - 99	13	76%	Tall
100 - 120	3	18%	Very high

The table above shows the results of the *posttest* on high-level thinking skills of early childhood conducted by researchers in the experimental group, the results show that there is 1 child or 6% in the low category, there are 13 children or 76% in the high category and there are 3 children or 18% in the high category. very high.

Table 4. Normality Test Results

	Class	Kolmogorov-Smirnov [a]		
		Statistics	df	Sig.
Results	Pretest	,095	17	,200
	Posttest	,104	17	,200

The data above shows the results of the normality test, the data is declared to be normally distributed if the significance value is more than 0.05, from the above data obtained a significant level (2 tailed) on the *pretest* and *posttest* of 0.200 which means more than 0.05 and can be interpreted as data is normally distributed .

Table 5. Hypothesis Test Results

Paired Samples T-Test								
	Paired Differences							
	mean	std. Deviation	std. Error Mean	95% Confidence Interval of the Difference		T	df	Sig. (2-tailed)
				Lower	Upper			
pair 1	-14.05882	4.09986	.99436	-16,16678	-11.95087	-14,139	16	.000

The hypothesis is accepted if the significance value (2-tailed) > 0.05 . From the data above, the result of the t-test calculation is that the t-count > t-table, which is 77.328 > 2.120, with sig 0.000, then Ho is rejected and Ha is accepted. It can be concluded that "There is a development of higher order thinking skills in children using maze games".

DISCUSSION

High-order thinking skills in early childhood at Aisyiyah Bustanul Athfal Pengabean Kindergarten class B showed an increase or *treatment* through maze games. In this study, it was seen that children's higher order thinking skills increased in using the maze game. This maze game was created primarily to develop high-level thinking skills for early childhood , especially aged 5-6 years, besides that this game can also develop children's creativity and activeness because through this game children work independently and with children's creativity in completing games. When playing the maze game, the child does not realize that when playing the game the child is honing high-level thinking skills, activeness and creativity because it is packaged in an interesting maze game with many colors and pictures. So children don't only play digital media games without meaning and without control but by playing maze games, children unknowingly also develop high-level thinking skills. This research is in accordance with the theory put forward by Setyadi and Qohar in (Setyadi, 2017) , which states that the use of interesting learning media can increase students' motivation and interest in learning, which in turn causes students to succeed in understanding the material. Plus the theory from Nugroho (Nugroho, 2021) which states that with the development of high-level thinking skills children can increase achievement, increase motivation, especially motivation to learn, and increase children's positive attitudes.

The success of this research is influenced by the supporting factors used in this study, namely by using learning media in the form of games. Early childhood learning media is increasingly important considering the development of children at this age is a period where they start to think concretely (Hasjiandito et al., 2015) . In this study using learning media in the form of a maze game. Through maze games, children can play and develop their cognitive abilities with fun activities.

Giving maze games to improve children's higher-order thinking skills. Where there is an influence on the ability of high-level thinking skills in early childhood because of the questions in playing and after playing the maze game which causes children to think critically in answering the questions given, thus causing the development of higher-order thinking skills in children.

Based on the results of the study, it can be seen that giving maze games can develop high-level thinking skills in early childhood. It can be seen that children are able to think critically and creatively about the problems that exist in the maze game. Can collaborate and communicate their wishes in opinion.

CONCLUSION

Based on the discussion of the results and the results of the analysis of research data with maze games, it can be concluded that high-level thinking skills of children aged 5-6 years are increased through maze games which are seen by the effectiveness of the application of the game so that there is an increase in the development of high-level thinking skills of children aged 5-6 years. 6 years can be seen significantly from the pretest results which show 9 children or 53% in the low category and 8 children or 47% in the high category, while the posttest results show that the-

re is 1 child or 6% in the low category, 13 children or 76% in the low category. in the high category and there were 3 children or 18% in the very high category.

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