THE INFLUENCE OF COMPUTATIONAL THINKING SHEET FOR KIDS (CTSK) MEDIA ON COGNITIVE DEVELOPMENT ASPECTS OF CHILDREN AGED 5-6 YEARS

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ABSTRACT

Computational Thinking (CT) is a cognitive or thinking process that involves logistical reasoning. CT needs to be taught to children from an early age because it can help children develop critical thinking skills, creativity, and problem-solving abilities. This research was conducted with the aim of determining the effect of using CTSK media on the cognitive development of children aged 5-6 years. CTSK is a computing-based learning media specifically designed for preschool children. This study used a pre-experimental research design. The data analysis was performed using IBM SPSS Statistics 26 software. The results of this study indicate that the use of CTSK has a significant influence on cognitive development in children aged 5-6 years. Thus, the use of the Computational Thinking Sheet for Kids (CTSK) media can be an effective alternative for facilitating cognitive development in children aged 5-6 years. The implementation of CTSK can help children develop computational thinking skills, solve problems, and improve other cognitive activities.

Keywords: *Computational Thinking Sheet for Kids (CTSK) Media, Cognitive Development Aspects, Children Aged 5-6 years*

INTRODUCTION

The quality of education in Indonesia is currently increasing, in 2023, based on data released by worldtop20.org, Indonesia's education ranking will be 67th out of 209 countries throughout the world. This ranking was produced based on a survey of five levels of education in Indonesia: early childhood school enrollment rate of 68%, elementary school (SD) completion rate of 100%, junior high school (SMP) completion rate of 91.19%, senior high school completion rate (high school) 78%, and college graduation rate of 19%. Education plays an important role in human life because education aims to overcome the destruction and poverty that occurs in Indonesia and to increase the potential for high-quality human resources (HR). Education is a right of all Indonesians and can be received by every individual from the age of 0 years. The education received from each individual begins at the age of 0–6 years at the Early Childhood Education (PAUD) level. The age of 0-6 years is the appropriate age to lay the foundation for children's first education, one of the goals of which is to prepare children for continuing higher education. Children can obtain PAUD through family or school education. According to Khaironi (2018), early childhood education helps prepare children for higher education. Preparation of early childhood for higher education requires stimulation and improvement of children's abilities, so that

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children can adapt and adapt their abilities well to the educational and learning environment in subsequent education.

One of the abilities needed in the 21st century is computational thinking (CT). According to Jim (2016), computational thinking does not mean thinking like a computer, but rather thinking about computing, where someone is required to (1) formulate a problem in the form of a computational problem and (2) develop a good computational solution (in the form of an algorithm) or explain why a suitable solution was not found. Several countries have implemented CT in their education curricula. This approach is intended to allow children to learn about CT from an early age and apply it to all aspects of life. Yadav and Berges (2019) stated that CT is considered a universal construction that must be added to every child's analytical abilities as an important element in their school learning.

CT must be taught to children at an early age and can be obtained through early childhood education (PAUD). The enrollment rate for early childhood education (PAUD) in Indonesia has reached 68%. This indicates that Indonesia's awareness of PAUD is increasing. The Indonesian people's awareness of PAUD can be seen from the many people who compete to provide education to their children from an early age for various positive reasons and goals, as well as the hope that their children will have better intellectual, emotional, and spiritual abilities. Children's intellectual, emotional, and spiritual needs should be stimulated from an early age so that they can develop optimally. PAUD not only stimulates these three intelligences but also 6 aspects of development, which include language, physical motor skills, art, religious moral values, social emotional, and cognitive (Nofianti, 2021). The 6 aspects of development stimulated through PAUD help children adapt to the environment and understand various complex concepts and ideas. In addition, they can also develop critical thinking skills, creativity, and problem-solving abilities, which are developed through cognitive development and applied to PAUD activities. The activities conducted at PAUD pay attention to the needs of early childhood, especially the improvement of cognitive development. According to Piaget, cognitive development in early childhood (4-6 years) occurs in the pre-operational stage. In the pre-operational stage, children can use symbolic and concrete language and thinking; thus, appropriate stimulation is necessary to develop these cognitive abilities. According to Susanto (2018) cognitive is a thinking process, namely the individual's ability to connect, assess, and consider an incident or event. Cognitive development in children occurs in different sequences according to age. Each stage of a child's age can help explain how children think, store information, and adapt to their environment.

Teachers can develop cognitive abilities through daily school learning activities. The activities carried out can use interesting media so that children are enthusiastic about learning, so that learning goals are achieved and cognitive abilities are well stimulated. However, most children aged 5-6 years at kindergarten have poor cognitive abilities. It is considered inadequate because children aged 5-6 years cannot classify objects, sequence patterns, and match objects. This is due to the lack of use of interesting and targeted media. Children experience difficulty when asked questions related to object classification, sorting patterns, and object matching. This is complicated by the lack of media use in learning. Through the results of observations, there is a need for media using the CT method through children's worksheets called Computational Thinking Sheet for Kids (CTSK), which are able to support the learning process, so that they can improve children's cognitive abilities. This requires practice or getting used to CT for children. In training or getting used to CT with children, this can be achieved by incorporating or adding CT into the learning method. The method in question may be related to the packaging of the material, learning media, or learning model used. This can be achieved using the Computational Thinking Sheet for Kids (CTSK) as an interesting medium for children. Through the results of pre-research conducted by researchers at one private Kindergarten in Surabaya, it can be concluded that children's cognitive development has not developed optimally, considering the results of the presentation above; therefore, researchers are interested in conducting a study on this issue.

LITERATURE REVIEW

Computational Thinking does not mean thinking like a computer, but computational thinking where a person must (1) develop a problem as a computational problem and (2) develop good computational solutions (in the form of "algorithms") or understand why they fail to find a suitable solution. The basic cognitive abilities in CT are spatial abilities, thinking abilities, and problem solving abilities (Román-González et al., 2017). CT is a thinking process (or human thinking skill) that uses analytical and algorithmic approaches to design, analyze, and solve problems. Through the Computational Thinking Sheet for Kids (CTSK) children are guided to learn to think on a computational basis with the aim of developing computational thinking skills in children to enable them to think critically in aspects of cognitive development and improve indicators of classifying objects, sorting patterns and oddities via CTSK media. CTSK needs to be introduced to children from an early age so that they will get used to computational thinking, especially to improve aspects of cognitive development in the indicators of classifying objects, sorting patterns and matching objects (Kemdikbud, 137).

Early childhood is a golden period that needs to be equipped with knowledge and habits that bring goodness and benefits. According to Piaget and Inhelder (2019), the cognitive development of preschool children aged 4 to 6 years is at the pre-operational stage, at the pre-operational stage children have the ability to use language, think symbolically, and can think symbolically and concretely, so there needs to be appropriate stimulation to develop these cognitive abilities. Early childhood cognitive abilities need to be stimulated to improve children's ability to solve problems. Efforts to stimulate aspects of cognitive development need to be done from an early age so that there is no delay in the development of cognitive aspects which can lead to a decline in intellectual function, difficulty processing information, and difficulty communicating. According to Piaget (cited in Sujiono, 2013) cognitive ability is a fundamental thing that directs children's behavior towards understanding knowledge in all aspects in a structured manner. Understanding knowledge in a structured manner can support children in thinking more complexly. Aspects of cognitive development, especially the ability to think more complexly, the ability to reason and solve problems using mathematics, the development of these cognitive abilities will help children master knowledge more easily, have broader general awareness and skillfully use memory (Pudjiati and Masykouri, 2017). Aspects of cognitive development of children aged 5-6 years that need to be developed through CTSK are classifying objects, sorting patterns and matching. Developing cognitive abilities can be done by teachers in daily learning activities at school. The activities carried out can use interesting media so that children are enthusiastic about learning, so that learning goals are achieved and cognitive abilities are well stimulated.

Media is anything that can be used as a tool to channel messages that can stimulate children's thoughts, attention and willingness to learn so that they can encourage the learning process (Guslinda, 2018:1). Based on this understanding, it can be interpreted that media is a tool used during learning to make it easier for teachers to convey messages to children. Media can be used during learning activities in class to attract children's attention so that children can be interested in participating in learning. Learning media has a positive impact, with the existence of learning media the process of teaching and learning activities becomes more conducive so that it is able to achieve the expected learning objectives. An interesting medium that can be used to improve aspects of children's cognitive abilities using Computational Thinking, namely worksheets. Dahar (2016) reveals that student worksheets are worksheets that contain information and instructions from teachers to students so that students can carry out learning activities themselves, through practice or application of learning outcomes to achieve learning objectives. The existence of LKS can help teachers convey information and material more easily. Worksheets or Student Worksheets (LKS) are one type of learning aid (Hidayah and Sugiarto, 2016). By using LKS , teachers are helped in providing understanding regarding the material or messages to children so that it is easier for children to understand the material presented by the teacher. LKS also aims to train students to think more carefully in teaching and learning activities and can increase students' interest in learning (Sudiati, 2018).

RESEARCH METHODS

This research uses quantitative methods with a pre-experimental research design. According to Sugiyono (2019), pre-experimental research is a research design in which external variables can influence the formation of the dependent variable. Therefore, in the experimental results, the dependent variable is not only influenced by the independent variable. This research used a one group pretest-posttest design. According to Sugiyono (2019), this one group pretest-posttest design is carried out by giving a test before being given treatment and after being given treatment to strengthen the results of the research that has been carried out. The one group pretest-posttest design research design can be described as follows:

O1 X O2

Notes:
O1 = pretest value (before treatment)
X = treatment given
O2 = posttest value (after treatment)

The population in this study were all children aged 5-6 years at Kindergarten in one private school in Surabaya. The sampling technique used in this research is nonprobability sampling. Nonprobability sampling is a sampling technique that does not provide equal opportunities or opportunities for each member of the population to be sampled (Jasmalinda, 2021). The nonprobability sampling technique used in this research was saturated sampling. Saturated sampling is a sampling technique by taking all members of the population to be used as samples (Sari, 2019). The data collection procedures in this research are tests, observation, and documentation, with assessment instruments in tests and observations having the criteria of Not Yet Developing (BB), Starting to Develop (MB), Developing According to Expectations (BSH), and Developing Very Well (BSB) whose results can be seen through behavior in accordance with the observed indicators, namely classifying objects, sorting patterns, and matching, as follows.

Table 1. Test Assessment Instrument

No.	Observed behavior	BB	MB	BSH	BSB
1.	Children classify objects using geometric puzzles				
2.	Children sort patterns using geometric puzzles				
3.	Children match objects using geometric puzzles				

Notes:
BB : Undeveloped
MB : Starting to Develop
BSH : Developing According to Expectations
BSB : Developing Very Well

Table 2. Treatment Assessment Instrument

No.	Observed behavior	BB	MB	BSH	BSB
1.	Children classify objects using the Computational Thinking Sheet for Kids (CTSK)				
2.	Children sort patterns using the Computational Thinking Sheet for Kids (CTSK)				
3.	Children match objects using the Computational Thinking Sheet for Kids (CTSK)				

Notes:

BB : Undeveloped
MB : Starting to Develop
BSH : Developing According to Expectations
BSB : Developing Very Well

After the data were collected, the next step was to analyze the data. Data analysis used the Statistical Products and Services Solutions (SPSS) v.26 program. Data analysis using the Normality Gain test can test the treatment given to children.

$$\textbf{Normalized Gain } (n-gain) = \frac{\textbf{Skor Posttest} - \textbf{Skor Pretest}}{\textbf{Skor Maks} - \textbf{Skor Pretest}}$$

According to Hake (cited in Zuraida & Asma, 2018) the criteria for the N-Gain Test are as indicators to determine the results of the N-Gain as follows.

Interval Skor	Kategori
$g > 0{,}70$	Tinggi
$0{,}30 \leq g \leq 0{,}70$	Sedang
$g < 0{,}30$	Rendah

Hypothesis testing in this research used a paired T-test (Paired Sample T-Test). Paired Sample Test T-test is a type of hypothesis test that uses paired data. In line with the view of Montolalu and Langi (2018), who stated that the characteristics of the Paired Sample T-test test are the same research object but receive two different treatment methods. Although we use the same object, we obtain two types of data samples: data from the first processing step and data from the second processing. Based on Montolalu and Langi (2018) the Paired Sample T-test test formula is as follows:

$$t = \frac{\frac{\sum D}{n}}{\frac{s}{\sqrt{n}}}$$

$$s = \sqrt{\frac{1}{n-1} = \left(\sum D^2 - \frac{(\sum D)^2}{n}\right)}$$

Notes:

t : Calculated t value
D : Difference between O1 and O2 (pretest value and posttest value)
n : Number of sample members
s : Sample standard deviation

Results	Notes
Sig Value. (2-*tailed*) < 0.5	H_a accepted and H_0 rejected
Sig Value. (2-*tailed*) > 0.5	H_a rejected and H_0 accepted

The research flow of this study is as depicted in Figure 1.

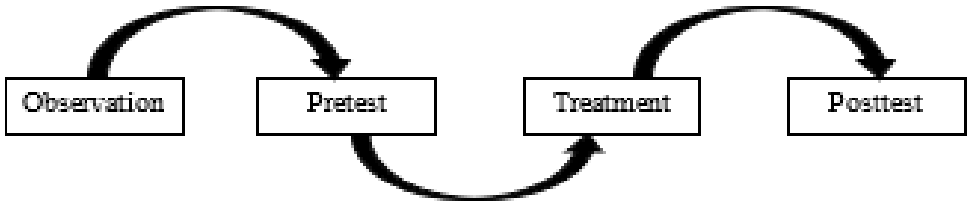

Figure 1. Research Flow

The research flow describes the activities performed during the research. Before conducting the research, the researcher made observations with the aim of observing problems in kindergarten children aged 5-6 years. The researcher then gave a pretest to the children with the aim of measuring the child's initial abilities before taking part in the treatment using geometric puzzle media, after the researcher giving a pretest followed by giving treatment to children using CTSK for a period of 2 months with the aim of providing treatment to improve aspects of children's cognitive development in the indicators of classifying objects, sorting patterns, and matching. During treatment, the children worked on assignment sheets containing questions on classifying objects, sorting patterns, and matching. Finally, the researcher gave a posttest to the children with the aim of measuring and observing the results of the children's abilities after being given treatment using geometric puzzle media. From the flow above, it can be seen in the research chart (Figure 2) that was carried out as follows.

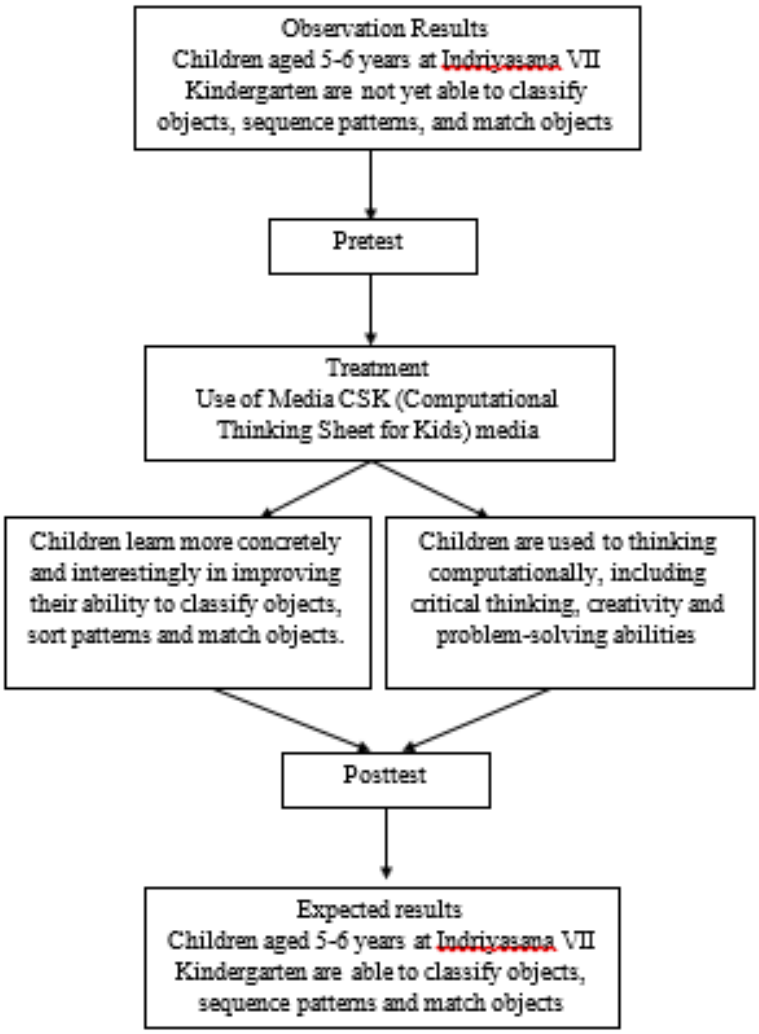

Figure 2. Research Chart

Hardani, (2021) explains that a hypothesis is a temporary answer to a problem being studied. The following is the hypothesis of the research:

Ha: There is an influence of Computational Thinking Sheet for Kids (CTSK) media on aspects of cognitive development of children aged 5-6 years at Kindergarten.

H0: There is no influence of Computational Thinking Sheet for Kids (CTSK) media on aspects of cognitive development of children aged 5-6 years at Kindergarten.

FINDINGS AND DISCUSSION

Findings

As stated previously, this study started with a pretest. The first day of research involved giving a pretest. The pretest given uses 3 indicators. Indicator 1 classifies objects using a geometric puzzle; indicator 2, sorting patterns; and indicator 3, matches objects using a geometric puzzle. The pretest scores are presented in Table 3.

Table 3. Pretest Results

No	Name	Achievement Indicators			Total
		Indicator 1	Indikator 2	Indicator 1	
1	KA	3	2	2	7
2	MB	2	2	2	6
3	MM	3	3	3	9
4	MS	3	2	3	8
5	MF	2	2	2	6
6	AA	3	3	3	9
7	DA	2	2	2	6
8	FN	2	2	2	6
9	GA	2	2	2	6
10	HM	2	2	2	6
11	MH	2	2	2	6
12	NA	3	2	2	7
13	NQ	2	2	2	6
14	NL	3	2	3	8
15	ZI	2	2	2	6

Assessment Description:

1 (BB) : Undeveloped
2 (MB) : Starting to Develop
3 (BSH) : Developing According to Expectations
4 (BSB) : Developing Very Well

Treatment

Treatment was performed on the second to ninth days of the study. Treatment was performed on November 3, 7, 10, 17, 20, 21, 22, 23, and 24 of 2023. Treatment was carried out with 3 indicators, the first indicator was carried out on the first 3 days of treatment, namely, 3, 7, and 10 November 2023, and then continued with the second indicator on the next 3 days, namely, 17, 20, and 21 November 2023, and finally the third indicator was carried out on 22, 23, and 24 November 2023. The following are the data obtained from the treatment results:

Table 4.Treatment Results

No	Name	Indicator	Treatment Day								
			2	3	4	5	6	7	8	9	10
1	KA	I1	2	3	4						
		I2				2	2	3			
		I3							2	3	3
2	MB	I1	3	4	4						
		I2				2	3	4			
		I3							2	3	4
3	MM	I1	2	2	3						
		I2				3	3	4			
		I3							2	3	3
4	MS	I1	3	3	4						
		I2				3	3	4			
		I3							2	3	4
5	MF	I1	3	3	4						
		I2				3	4	4			
		I3							3	4	4
6	AA	I1	3	3	3						
		I2				2	3	4			
		I3							2	3	4
7	DA	I1	3	0	3						
		I2				3	3	4			
		I3							3	3	4
8	FN	I1	2	3	3						
		I2				3	3	3			
		I3							2	3	3
9	GA	I1	0	3	3						
		I2				2	3	4			
		I3							3	3	3
10	HM	I1	3	4	4						
		I2				2	3	4			
		I3							3	4	4
11	MH	I1	3	2	3						
		I2				3	3	3			
		I3							2	3	3
12	NA	I1	3	4	0						
		I2				3	3	4			
		I3							2	3	3
13	NQ	I1	0	3	4						
		I2				2	3	3			
		I3							3	3	4
14	NL	I1	2	2	3						
		I2				2	2	3			
		I3							2	3	3
15	ZI	I1	2	2	3						
		I2				3	3	3			
		I3							2	3	4

Notes:

I1 : Children classify objects using the Computational Thinking Sheet For Kids (CTSK)
I2 : Children sort patterns using the Computational Thinking Sheet For Kids (CTSK)
I3 : Children match objects using the Computational Thinking Sheet For Kids (CTSK)
0 : The child is not coming in
1 : Undeveloped
2 : Starting to Develop
3 : Developing According to Expectations
4 : Developing Very Well

Posttest

The posttest was carried out on the last day of the research, the posttest was carried out by giving the same test as the first day of the research, while still using the same 3 indicators. 1 is classifying objects using a geometric puzzle, indicator 2 is sorting patterns using a geometric puzzle and indicator 3 is matching objects using a geometric puzzle. The scores from the pretest results are as follows:

Table 5. Posttest Results

No	Name	Achievement Indicators			Total
		Indicator 1	Indikator 2	Indicator 1	
1	KA	4	3	4	11
2	MB	3	3	3	9
3	MM	4	4	4	12
4	MS	4	4	3	11
5	MF	4	3	4	11
6	AA	4	4	4	12
7	DA	3	3	3	9
8	FN	3	3	3	9
9	GA	4	3	4	11
10	HM	4	4	3	11
11	MH	4	3	4	11
12	NA	4	4	4	12
13	NQ	3	3	3	9
14	NL	4	4	4	12
15	ZI	3	3	3	9

Assessment Description:
1 (BB) : Undeveloped
2 (MB) : Starting to Develop
3 (BSH) : Developing According to Expectations
4 (BSB) : Developing Very Well

Hypothesis Test Results

The hypothesis test was a paired sample t-test to determine the effect of CTSK media on the aspects of cognitive development of children aged 5-6 years at kindergarten, Indriyasana VII Surabaya. The results of the paired sample t-test were as follows:

1. Normality Test

The normality test used in this research is the Komolgorov-Smirnov test. The results of the normality test calculations in this study are as follows.

Normality Test Results

One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		15
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	.89642146
Most Extreme Differences	Absolute	.201
	Positive	.201
	Negative	-.201
Test Statistic		.201
Asymp. Sig. (2-tailed)		.105[c]

a. Test distribution is Normal
b. Calculated from data
c. Lilliefors Significance Correction

Based on the above calculation results, the obtained significance value is 0.000. Based on the normality test value criteria, a significance value of >0.05 indicates that the residual value is normally distributed. The obtained significance value is 0.000, which means 0.05; therefore, it can be concluded that the residual value is normally distributed.

2. Homogeneity Test

The homogeneity test was used to determine whether the data being analyzed had the same distribution or not. The results of the homogeneity test calculations in this study are as follows:

Homogeneity Test Results

Test of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
pretest	Based on Mean	.262	1	28	.613
	Based on Median	.127	1	28	.724
	Based on Median and with adjusted df	.127	1	26.296	.724
	Based on trimmed mean	.302	1	28	.587

Based on the above calculation, the obtained result is 0.613. Based on the obtained data, 0.613 is greater than 0.05. Based on the homogeneity test criteria, a value of 0.05 indicates that the data are homogeneous. It can be concluded that 0.613 > 0.05 indicates that the obtained data are homogeneous.

3. Paired Sample T-test

Hypothesis testing in this study used the paired sample t-test. The results of the paired sample t-test calculation in this study are as follows:

Paired Sample T-test Calculation Results

Paired Samples Test

		Paired Differences					T	Df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	*pretest* – posttest	-3.800	.941	.243	-4.321	-3.279	-15.638	14	.000

The criteria for the paired sample t-test are as follows: if Sig. (2-tailed) < 0.5 then Ha is accepted and H0 is rejected, whereas if Sig. (2-tailed) > 0.5, then Ha is rejected and H0 is accepted. Based on the above data, we have Sig. (2-tailed) = 0.000, which means that Ha is accepted, and H0 is rejected. Therefore, it can be concluded that the CTSK media influences the aspects of cognitive development of children aged 5-6 years at Kindergarten in Surabaya.

DISCUSSION

This research was conducted to determine the effect of CTSK media on the cognitive abilities of children aged 5-6 years at Kindergarten, who are known to have poor cognitive abilities. It is said to be lacking because children cannot classify objects, sequence patterns, and match objects. If you refer to the Child Development Achievement Level Standards (STPPA), children aged 5-6 years should be able to do this and easily solve simple problems contained in the worksheet. Problems with children's cognitive abilities are complicated by a lack of media use in learning activities. Based on this problem, researchers conducted a study to determine the effect of CTSK media on the cognitive abilities of children aged 5-6 years.

The pretest results showed that most children aged 5-6 years received poor scores on these 3 indicators. During the treatment using CTSK media, the researchers made observations; initially, it appeared that they were still less able to solve each problem, but starting from the 5th meeting the children were seen to show improvement in 3 treatment indicators, which included indicator 1, children classifying objects using CTSK, indicator 2, children sorting patterns using CTSK, and indicator 3: children match objects using CTSK. It can be seen that children began to be able to classify objects, sequence patterns, and match objects. The child's cognitive abilities continued to improve until the 10th meeting. At the last meeting, the children were given a posttest with 3 indicators according to the indicators used during the pretest.

The posttest scores showed an increase, which was indicated by the scores obtained from the children being better than the scores obtained from the children during the pretest. After treatment using CTSK for learning, good results were found, namely that children's cognitive abilities increased. This result supports Fadillah's statement (2018) that using learning media can stimulate students' thoughts, feelings, attention, and desires, thus encouraging the continuity of the learning process. The use of CTSK media in the form of worksheets allows children to think critically and creatively when solving problems in activities related to classifying objects, sorting patterns, and matching objects. This result agrees with Sudiati's idea (2018) that worksheets can help students think more carefully in teaching and learning activities and can increase students' interest in learning. Children can more easily understand the questions faced on the worksheet because the CTSK worksheet is designed according to Computational Thinking (CT), which can train children and improve their cognitive abilities by thinking critically. According to Susanto (2018), cognitive thinking, understanding, remembering, and solving everyday problems mathematically. Cognitive skills for critical thinking and problem solving can be trained using concrete and interesting media.

Research on the influence of the Computational Thinking Sheet for Kids (CTSK) media is the second research conducted on students introducing CT to early childhood with the aim of developing cognitive development. The results obtained are consistent with the results of previous research entitled "Computational Thinking: CSK Learning Media (CT-Sheet for Kids) in PAUD Mathematics". The research was conducted on 21 Himmatul Hidayah PAUD children in Pojok Village, Kwadungan District, Ngawi Regency, East Java. In this study, the results of data processing were obtained, namely, the normality test using the Chi-Square test with a Lobs result of 0.0960 and Lcritik of 0.0997, so H0 was accepted as the conclusion that the object was normally distributed. To evaluate the reliability of the data using the Alpha formula, the r11 result was 0.9474. Because r11 is greater than 0.7, the data is reliable.

CONCLUSIONS AND SUGGESTION

The abilities that need to be stimulated and that teachers should pay attention to are the abilities that children need in the 21st century. The abilities that children need in the 21st century include the ability to think computationally, or computational thinking (CT), by increasing aspects of cognitive development through PAUD learning activities. The goal is that every child has the opportunity to receive optimal stimulation, especially in the areas of creative development. Efforts to stimulate aspects of cognitive development must be made at an early age because a delay in stimulating aspects of cognitive development can affect intellectual function, disrupt

awareness, and cause learning difficulties. Efforts to stimulate cognitive development can be done using interesting media so that children are enthusiastic about learning, so that learning goals are achieved and cognitive abilities are well stimulated. The media that teachers can use in this case is CTSK. CTSK is designed to stimulate the cognitive development aspects of children aged 5-6 years in a more enjoyable way. Through the CTSK media, it is hoped that children will actively engage in activities that stimulate cognitive development.

Based on the current research, it can be concluded that the CTSK media has an influence on the aspects of cognitive development of children aged 5-6 years at Kindergarten. The results of the paired sample t-test in this study were Sig. (2-tailed) = 0.00. That is, Sig. (2-tailed) < 0.5 which means Ha is accepted, and H0 is rejected. Thus, CTSK media influences the aspects of cognitive development in children aged 5-6 yearskindergarten. CTSKCTSK media stimulate cognitive development in children aged 5-6 years. It can be seen that children are enthusiastic about learning because concrete learning media enable children to learn with direct experience, so they directly observe and demonstrate the learning provided. CTSK allows children to think critically and creatively when solving problems related to classifying objects, sorting patterns, and matching objects.

Based on this study, suggestions can be given to introduce CT to children aged 5-6 years by improving aspects of cognitive development using CTSK media, namely that educational institutions can facilitate learning carried out by teachers and children, especially the media used to stimulate aspects of cognitive development, apart from that, PAUD teachers can also always design learning that is more enjoyable with learning media so that learning objectives can be achieved and so that future researchers can develop learning media to stimulate aspects of cognitive development.

REFERENCES

Dahar, Ratna Willis. 2011. *Teori Belajar dan Pembelajaran.* Jakarta: Penerbit Erlangga.

Fadillah. (2018). *Bermain dan Permainan*. Jakarta: Pranedamedia.

Guslinda dan Rita. 2018. *Media Pembelajaran Anak Usia Dini*. Surabaya: Jakad Media Publishing.

Hardani, dkk. (2020). *Metode Penelitian Kualitatif & Kuantitatif*. Yogyakarta: Pustaka Ilmu Group Yogyakarta

Hidayah, I, Sugiarto, S, (2016). Suplemen Panduan Guru Dalam Pengembangan Pembelajaran Tematik Kompetensi Dasar Matematika Kelas IV. Kreano, *Jurnal Matematika Kreatif-Inovatif. Vol 4 (2). Page 115-125*

Jasmalinda. (2021). Pengaruh Citra Merek dan Kualitas Produk terhadap Keputusan Pembelian Konsumen Motor Yamaha di Kabupaten Padang Pariaman. *Jurnal Inovasi Penelitian*, 1(10), 2199-2206.

Jim, C., & Rom, M. (2016). Computers in Human Behavior Which cognitive abilities underlie computational thinking? *Criterion validity of the Computational Thinking Test n-Gonz a.* https://doi.org/10.1016/j.chb.2016.08.047

Kemendikbud. (2014). *Peraturan Menteri Pendidikan dan Kebudayaan No.137 tentang Standar Pendidikan Anak Usia Dini*. Jakarta: Indeks.

Khaironi, M. (2018). Perkembangan Anak Usia Dini. *Jurnal Golden Age Hamzanwadi University, 3*(1), 1-12. Retrieved November 26, 2022, from http://e-journal.hamzanwadi.ac.id/index.php/jga/article/view/739/590 Sudaryono. (2019). *Metode Penelitian Kuantitatif, Kualitatif dan R&D*. Bandung: Alfabeta.

Montolalu, C., & Langi, Y. (2018). *Pengaruh Pelatihan Dasar Komputer dan Teknologi Informasi bagi Guru-Guru dengan Uji-T Berpasangan (Paired SampleT-Test). D'CARTESIAN,7*(1), 44.

Nofianti, R. (2021). *Dasar-Dasar Pendidikan Anak Usia Dini* (Vol. 1). (R. Astuti, Ed.) Tasikmalaya, Jawa Barat, Indonesia: Edu Publisher. Retrieved 11 27, 2022

Piaget, J., & Inhelder, B. (2019). *The psychology of the child. New York*: Basic Books.

Pudjiati, M. (2011). *Bermain Bagi AUD dan Alat Permainan yang Sesuai Usia Anak.* Jakarta: Direktorat Pembinaan Pendidikan Anak Usia Dini

Román-González, M., Pérez-González, J. C., & Jiménez-Fernández, C. (2017). Which cognitive abilities underlie

computational thinking? Criterion validity of the Computational Thinking Test. *Computers in Human Behavior, 72, 678–691.* https://doi.org/10.1016/j.chb.2016.08.047

Sudaryono. (2019). *Metode Penelitian Kuantitatif, Kualitatif dan R&D*. Bandung: Alfabeta.

Sudiati (2018). *Pemilihan Media Pembelajaran yang Baik*. Bandung: CV Sinar Baru Oemar Hamalik.

Sujiono, Nurani Yuliani. (2013). *Konsep Dasar Pendidikan Anak Usia Dini*. Jakarta: Indeks.

Susanto, Ahmad. (2015). *Bimbingan dan Konseling di Taman Kanak-Kanak.* Jakarta:Pranamedia.

Widayanti (2017). *Konsep Dasar PAUD*. Bandung: Penerbit PT Remaja Rosdakarya.

Yadav, A., & Berges, M. (2019). Computer science pedagogical content knowledge: Characterizing teacher performance. *ACM Transactions on Computing Education, 19(3), 1–24.* https://doi.org/10.1145/330377

Zuraida, & Asma, C. N. (2018). Penerapan Model Pembelajaran Learning Cycle 5E Untuk Meningkatkan Hasil Belajar Siswa Konsep Sistem Pencernaan Makanan Pada Manusia Di Smp Negeri 2 Bandar Dua. *Prosding Seminar Nasional Biotik, 1*(1), 804–811.sudar