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THE EFFECT PLAY ACTIVITY AND COGNITIVE STYLES TOWARDS EARLY NUMERACY ABILITY (AN EXPERIMENTAL STUDY AT KINDERGARTEN IN SEMARANG CITY, 2014)

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ABSTRACT

This research aims to understand the influences of playing activity effects and the cognitive styles toward early numeracy ability, in kindergarten group B in Semarang. This study uses a method of 2x2 factorial design. The treatment is by giving activity in two methods, which are playing blocks and playing role play. This research is held in a kindergarten in Semarang with some group B students, from September until December 2014 with the sample which is taken through a method of multistage random sampling. The sample consisted of the children of kindergarten in Taman Putra and III Pertiwi Kindergarten each amounted to 22 students consisting of 11 field-dependent students and 11 independent field students. Data were analyzed by descriptive statistics. analysis and testing the hypothesis testing requirements analysis done by two lanes variance (Anova two-way). The results of this study are: 1) early numeracy ability of students who play blocks higher than children who play a role, 2) Ability initial count of students who have the cognitive style field of independent higher than students who have dependent cognitive style field, 3) the effect of the interaction between play activity and cognitive style, 4) a group of students who have independent cognitive style field early numeracy ability playing blocks higher than students who play roles, 5) a group of students who have the cognitive style of field-dependent numeracy start playing blocks lower than students who play a role, 6) group of students who play blocks early numeracy skills who have cognitive style field of independent higher than students who have dependent cognitive style field, 7) a group of students who play the role of early numeracy ability who have cognitive style field-dependent lower than students

who have cognitive style independent field. Based on the above, it can be concluded that the activity and cognitive style affect the ability of the initial count. Therefore, to improve the initial counting, selection, and implementation of activities to play and observe the child's cognitive style possessed very helpful. Based on the above, it can be concluded that the activity and cognitive style affect the ability of the initial count. Therefore, to improve the initial counting, selection, and implementation of activities to play and observe the child's cognitive style possessed very helpful. Based on the above, it can be concluded that the activity and cognitive style affect the ability of the initial count. Therefore, to improve the initial counting, selection, and implementation of activities to play and observe the child's cognitive style possessed very helpful.

INTRODUCTION

The importance of early childhood education has become a concern of the international community, in the 2000 World Education Forum in Dakar, Senegal where Indonesia as a member of the forum and bound to implement the agreement as a joint commitment has resulted in six collective agreements and one of the points is to expand and improve overall care and education for early childhood. Therefore, in the framework of preparing human resources, early childhood education holds a very fundamental position.

The Golden Age period in children can never be repeated, for that at this time the role of parents and teachers by providing positive and appropriate stimulation or stimulation so that at this time children can increase their knowledge which turns out to be useful for children in the future, stimulation can also be shape children's character at an early age. The process of providing stimulation or stimulation in early childhood should be carried out continuously and continuously according to their age level so that it can give good results and can be firmly embedded in their brains. Preschool age is the most effective age to develop the various potentials of children, one of which is to stimulate the ability to count.

Meanwhile, based on the publication of The Organization for Economic Cooperation and Development (OECD), the results of research conducted in the 2012 Program for International Student Assessment on children under 15 years of age, the results of this study show that the math abilities of Indonesian children are still in a bad category in the world, Indonesia is in ranked lowest with an average score of 375 or ranked 64th out of 65 countries in terms of ability in math, science, and reading compared to other children in the world which is still very low. Depdiknas (2000) states that numeracy skills are part of mathematics needed to develop numeracy skills which are very useful for everyday life, especially the concept of numbers which is the basis for developing mathematical skills.

A common phenomenon that develops in society regarding mathematics, especially at school age, is that mathematics is often considered a difficult subject and has even become a "scourge". OECD Secretary-General Angel Gurria said that 32% of children who took the math test could not solve

the easiest calculation problems. So without the most basic skills, he is worried that the children will likely drop out of school or have difficulty facing real life in the future.

Based on the results of preliminary observations made in Kindergarten teaching methods, learning media and the use of playing tools and the selection of play activities used by teachers in introducing early counting to children tend to be boring and uninteresting. Also, most teachers still tend to use traditional learning and have not made innovations in learning. Teachers still think that learning to count requires a lot of play/learning tools, and in the end, it costs a lot of money.

It should be noted that learning for early childhood is a learning process that is carried out through play. Playing is an important thing for children, by playing children feel happiness and joy. Children will grow and develop optimally if their playing needs can be met properly. Playing for Early Childhood is a very enjoyable activity. Playing is a process of preparing to enter the next world. Playing is a good way for children to gain knowledge about everything. Playing will foster children's exploration activities, train physical growth and imagination, and provide ample opportunities to interact with adults and other friends, develop language skills and increase vocabulary, and make learning a lot of fun. Playing is the most appropriate medium to use in kindergarten learning, the use of playing tools must also be appropriate, according to the material to be taught. For this reason, a teacher must choose the right types of games and game tools as a medium for children's learning, especially learning to count.

In addition to playing activities, children's cognitive styles (learning styles) can also affect children's ability to learn, especially numeracy, according to Philips. MC, most of the anxiety/fear of mathematics lessons in the classroom due to the lack of consideration of the teacher about the different learning styles of students. This should also be of concern to teachers that each child is unique and that no two people have the same life experience so that it can also be interpreted that the learning style of each child is also different from one child to another. Children will be able to learn well and their learning outcomes are good if people around the children who provide learning for children can understand the cognitive styles of their students.

It is hoped that through this research it can be revealed first that playing as a learning medium can be maximized, especially the games that are often played in Kindergarten so that the playing activities that are often carried out by children are more meaningful and meaningful. Second, a teacher must be more innovative and creative in choosing and utilizing play activities for their students, especially in stimulating numeracy skills, and third, teachers know and understand the characteristics of their students, especially their cognitive style so that the learning process can produce good results. maximum and satisfying.

LITERATUREL REVIEW

Initial Counting Ability

Learning to count Kindergarten in particular and early childhood, in general, does not only rely on children's cognitive abilities but also social and emotional mental readiness, therefore in practice it must be done in an interesting, varied, and fun way.

An ancient Greek philosopher, Plato, taught his students arithmetic through play, Plato thought that children would easily learn arithmetic using the play method. Children would find it easier to learn arithmetic by distributing applies to children.

According to Hohmann, Weikart & EpsteinPreschoolers also acquire vocabulary words to label their quantitative understanding, words such as big, small, more, less, tall, short, many, and only a little. According to Clawson, when a person is counting, several parts of the brain are involved, namely the regions of the brain that are responsible for.

Standards 2000 Project US ren[35]s the *National Council of Teachers of Mathematics* which is called the Principles and Standards for School Mathematics. This publication includes ten standards for pre-school to grade 12 learning. This standard suggests that in the pre-school period, mathematics learning is more emphasized on the child's ability to recognize numbers and count accurately and efficiently, both mentally and above. paper, and have a sense of the size of a number.

According to Charlesworth and Lind, one important aspect of the concept of numbers is counting. Preschoolers often learn to memorize counts, read the numbers they remember. Rote counting must be distinguished from rational counting, as is shown when children stick numbers to a series of pictures in a group. Charlesworth and Lind also define knowledge of mathematical logic as a type that includes the relationships that each constructs to understand the outside world and makes sense to organize information such as classifying, calculating, and comparing.

Wright et. al divides numeracy skills into five stages of ability Stages of Early Arithmetical Learning (SEAL). According to Gelman and Meck in Leonard, the concept of counting (counting) consists of five assessment components, namely: One-to-one correspondence, The stable order principle, Cardinality, The order irrelevance principle, and The abstraction principle.

Based on some of the opinions above about the components of early counting skills, it can be concluded that the components of early childhood numeracy skills include: 1) Number recognition, 2) Number operations, 3) Sorting, sorting and classifying, and 4) Equating and differentiating.

Playing Activities in Children

Play is the essence of creativity in children, play is universal and knows no ethnic and cultural boundaries. According to Frost et. al, play is a reflection of a child's growth, the essence of a child's life, a window to the child's world.

For a child, playing is a very satisfying activity, where children get control to understand life.

According to Mayesky, playing in children is a natural and best way for children to learn because in play activities they investigate and observe themselves and others. Children are natural explorers who have a need and desire to explore their world through real experiences.

According to Semiawan, playing for children is a serious but fun activity. Through play, his various jobs are realized. Hurlock gives the understanding that play is any activity that is carried out for the fun it creates, without considering the final result. Play is done voluntarily and there is no coercion or pressure from outside or obligation.

According to Piaget in Tedjasaputra playing is an unbalanced state where assimilation is more dominant than accommodation. The way children think differently from adults, children learn through the process of imitating and playing, showing the process of assimilation and accommodation activities, which describe each stage and age of children's cognitive maturity when playing, the assimilation process is more dominant than accommodation.

Erikson in Schousboe and Lindqvist sees play as a manifestation of children's ability to control reality through experimentation and planning, through play, children learn to participate in all kinds of social activities and real community play also functions as a self-healing process. Through play, children learn new things, when to use these skills, and satisfy their needs. Even though playing, the child's physicality will be trained, cognitive abilities and interacting with other people will also develop.

The game activities used in this study are playing blocks and role-playing.

1. Playing Block

The game of block was first introduced in educational circles by Friedrich Froebel in 1837, Friedrich Frobel either directly or indirectly became a "key player" in popularizing and commodifying constructive games. This is not to say that Fröbel invented the construction game. Game of wooden blocks and alphabet blocks dating from the late 18th century is evident in many block games found in toy museums. The wooden block games used today were designed by Carolyn Pratt in the early 1890s.

According to Saracho, playing blocks depicts children playing with small units of blocks, large blocks for building large structures, and block accessories to add content to construction. When children play with blocks their science skills and math skills are honed. Through playing blocks, children can express their abstract imagination into something concrete and get important concepts in solving math problems, and so on.

According to Essa, blocks are one of the most versatile and fun materials found in a classroom. Blocks come in many shapes and sizes, made of various materials, can be used alone or in combination with other items.

2. Role-Playing

Gordon and Browne suggest that romantic play can reveal children's attitudes and concepts towards people and things in their environment. Role-playing is largely wishful thinking, pretending is its greatest strength.

According to Jackman, romantic play is spontaneous play, in which children use their imagination to create and interpret characters, actions, or events.

According to Wilburn, role-playing is a form of symbolic play, role-playing involves using a child's imagination to manipulate reality and time. Saracho revealed that role-playing depicts how children pretend and act out of their day to day circumstances, acting is pretending to be in touch with their real-life experiences such as homes, beauty salons, post offices, restaurants.

According to Curtis, role-playing is playing the most complex, combining or combining several types of games.

Bennett, et. al., argues that role-playing is an internal cognitive process that is externalized through children's behavior in their play, including imagination, creativity, symbolization, 'as if' and 'what if' to convey and maintain pretense, all of which contribute to competence.

Birckmayer stated that role-playing for early childhood provides many benefits, children can interact together and improve their skills. Early childhood shows that they can use their imagination in pretend play.

According to Charlesworth and Lind in child role-playing, they use things to represent real things. By playing a role, math skills, especially arithmetic, can be improved.

3. Cognitive Style

According to Brown, learning style is the same as cognitive style, learning style is a person's way of dealing with a problem which tends to depend on a rather vague relationship between personality and cognition. Some scholars give the term for learning style in their writings including "cognitive style", "thinking style", "mind style", "way of thinking" contemporary experts use the term "intellectual style".

According to Santrock, the learning style is a typical method used by students in the learning process or receiving lessons. What is right for one child may not be right for another.

According to Saracho, the cognitive style identifies how individuals react to different situations. Desmita argues that cognitive style is a characteristic of individuals in the use of cognitive functions (thinking, remembering, solving problems, making decisions, organizing and processing information, and so on) that are consistent and long-lasting. Each individual will choose the preferred way to stimulate their environment. Some individual ways of giving respond more quickly, but some are slower. The ways of responding to these stimuli are closely related to attitudes and personal qualities.

According to Hartley, cognitive style is the individual's way of completing cognitive tasks in different ways based on their characteristics, or it can be said that the individual's typical way of completing their tasks. Cognitive style is a typical way or technique of thinking in completing tasks that require cognitive abilities.

Tennant argues that cognitive style, learning style, or conceptual style is a term that refers to an individual's characteristic and consistent approach to organizing and processing information. Problem-solving and solving depend on a person's cognitive style, how to respond, and find solutions and solve problems.

According to Witkin in Saracho, cognitive style can also be referred to as personal style, because this cognitive style describes a person's way of solving problems, understanding things, thinking, remembering, and assessing or individual styles in determining cognitive strategies in various situations.

Witkin et al., Divides cognitive style into two dimensions, namely Field Dependent (FI) and Field Independent (FD), this term was introduced by Witkin based on research conducted in 1950. Witkin found that the perception of the judgment of some people is consistently influenced by context, whereas for others the context has little or no influence.

According to Musser, the characteristics can be seen when Field Dependents interact with stimuli, they find it difficult to find the information they are looking for because other information masks what they are looking for. Meanwhile, Field Independent finds it easier to identify and select important information from the surrounding environment. When information is presented in an ambiguous and unstructured manner, the Field Independent will impose its structure on the information while Field Dependents will try to understand and study the information as presented and without restructuring the information.

According to Saracho, the measurement of cognitive style to determine if someone is categorized as Field dependent or Field Independent can be done in various ways and techniques. In this study, researchers will use the Goodenough-Harris Drawing Test (GHDT) to measure the cognitive style of class students in Kindergarten. The Goodenough-Harris Drawing Test (GHDT) is a standard measure used to assess conceptual thinking. This measurement is done by asking students to draw a set of male and female characters and the level of detail in both images determines the child's cognitive style. A more detailed image shows the independent fields. while less detailed images show field dependence. The criteria in this measurement are done by observing the characteristics in the picture.

A. Theoretical Framework

1) Differences in numeracy skills between groups of children who play blocks and groups of children who play roles.

According to Chalufour et.al in Charlesworth that building blocks provide the setting for the integration of mathematics and science. In playing

blocks, children play with various sizes of shapes and colors of blocks, so that they can help and stimulate children's numeracy skills. NAEYC in Charlesworth states that mathematics begins with the exploration of materials such as building blocks, sand, and water.

Role-playing is a play that is done to stimulate children's numeracy skills, by playing roles that tell about activities related to counting.

Based on these differences, play blocks more effective on numeracy than role-playing. That is, it is assumed that the numeracy ability of the group of children who played blocks was higher than that of the group of children who played roles.

2) **The difference in initial numeracy skills between groups of children who have field-independent and field-dependent cognitive styles**

Field independent and field-dependent cognitive styles affect children's numeracy skills. Cognitive style is a person's choice of the most effective way to receive information, manage information, and remember information obtained from the learning environment. Cognitive styles can be divided into two, namely the field-independent and field-dependent learning styles. The two cognitive styles have different characteristics.

Field dependent cognitive style is a cognitive style that focuses on global acceptance, has a social orientation, requires external factors, namely goals and reinforcement, looks for clues from the environment as a source of information, is very interested in people, is closer to the people who interact with it. Children with a field-dependent cognitive style are more oriented towards direct relationships with people, such as the social sciences.

Based on this description, it can be assumed that there are differences in Initial numeracy skills between groups of children who have a field-independent cognitive style and a group of children who have a field-dependent cognitive style. The group of children who have a field-independent cognitive style is expected to have a higher numeracy ability than the field-dependent cognitive style in this study.

That is, it can be assumed that the interpersonal intelligence of the group of children who have a field-independent cognitive style is higher than that of the group of children who have a field-dependent cognitive style of initial numeracy.

3) **The effect of the interaction between play activities and cognitive style on initial numeracy skills.**

The field-independent and field-dependent cognitive styles in the initial numeracy skills have different characteristics and interests.

In the process of learning to play, it is still applied, with the principle of learning through play. In addition to various types of children's play in the learning process children also have different cognitive styles or cognitive

les, in this case, field-independent cognitive style and field-dependent cognitive style.

The suitability between the cognitive style and the type of play that is applied greatly affects the ability to count early. Therefore, teachers or educators are expected in the learning process to always adjust the cognitive styles possessed by students with children's play and learning activities, so that students can improve their social skills. According to Saracho, in the learning process children also have different cognitive styles or cognitive styles

Based on this explanation, it can be assumed that there is an influence of the interaction between play activities and cognitive styles on children's social skills.

4) **The difference in initial numeracy skills between children who play blocks and role-play who have an independent field cognitive style**

Children who have an independent field cognitive style can separate objects into the smallest parts. Children are easier to master the game that are learned than children who do not have these characteristics. Children who have a field-independent cognitive style have the intelligence to analyze and organize information. Through this intelligence, children who have a field-independent cognitive style who play blocks can improve their initial numeracy skills, when compared to those who play roles. In playing blocks children play individually and children play based on their creativity, therefore playing blocks is more by the characteristics of students who have an independent field cognitive style.

Based on the description above, it can be assumed that there is a difference in the preliminary counting ability between the group of children who participate in playing blocks which is higher than the children who play roles in the group of children who have an independent field cognitive style.

5) **Differences in initial numeracy skills between children who play blocks and role-play in children who have a field-dependent cognitive style**

Children who have a field-dependent cognitive style can understand objects globally, find it difficult to take initiatives and organize or organize by themselves, tend to need more instructions to understand something, Students who have a field-dependent cognitive style have a social orientation, are very interested in people, are easier to collaborate with, and prefer jobs that require engagement with others. Role-playing is very suitable for children who have a field-dependent cognitive style who are more interested and happy to play in groups in which there are communication and interaction between individuals, in other words, children who have a field-dependent cognitive style are more likely to play roles.

Based on the description above, it can be assumed that there is a difference in the preliminary arithmetic ability between the group of students who play blocks is lower than the students who play roles in the group of

student who have a field-dependent cognitive style. That is, it is assumed that in the group of students who have a field-dependent cognitive style, the initial numeracy ability to play blocks is lower than that of the group of students who play the role.

6) **The difference in the initial numeracy ability between the group of children who had an independent field cognitive style and the field-dependent group of children who played with blocks.**

Block playing activities tend to be individual games, children are busier with their games because each of them faces their game tools. Children who have an independent field cognitive style are more independent and less influenced by the environment so that they can play a dominant and more individual role. Block playing activities are more likely to be played independently and individually, very suitable and fit the characteristics of children who have an independent field cognitive style who have characteristics that are more independent and less influenced by the environment. Based on the description above, It can be assumed that the initial numeracy ability of the group of students who had a field-independent cognitive style was higher than that of the group of students who had a field-dependent cognitive style. That is, it is assumed that in the group of students who have an independent field cognitive style by playing with blocks, their initial numeracy ability is higher than that of the group of students who have a field-dependent cognitive style.

7) **Differences in initial numeracy skills between groups of children who have field-independent cognitive style and a group of children who have field-dependent cognitive style who play roles.**

Role-playing activity is a cooperative game, in playing roles, communication, and interaction is prioritized because of the success and meaning of this game when each child interacts with one another. Children who have a field-dependent cognitive style are more oriented towards social relationships than children who have a field-independent cognitive style, children who have a field-dependent cognitive style are happier when doing activities together, they prefer jobs that require involvement with other people. Children who have their field-dependent cognitive style are happier when doing activities together, they prefer jobs that require involvement with other people.

METHODS

This research was conducted in Taman Putra Kindergarten, Banyumanik District, and III Pertiwi Kindergarten, Tembalang District, Semarang City. This research will be conducted in September-December 2014.

The method used in this research is an experimental method with a design 2x2 factorial. According to Handini, the experimental research method is aimed

at examining the existence of a causal relationship between a risk factor and a certain effect, by giving treatment to one or more control groups that are similar but different in treatment.

This study involved two independent variables with two play activities and a cognitive style which included the independent field cognitive style and the dependent field and involved one dependent variable, namely the ability to count early.

This research was conducted with an experimental design according to a 2x2 factorial design. The treatment given was to present two playing activities, namely playing blocks and role-playing which then became the independent variables. While the attribute variable is the children's cognitive style, this variable is divided into two categories, namely the field-independent cognitive style (field independence) and the field-dependent cognitive style (field dependence).

Table 1. Research Design

Treatment Attribute		**Play activities**	
		BeamA1	Role A2
Style Cognitive	*Field Independent* B1 A1B1		
	Dependent Field B2	A1B2A2B2	

The population in this study were all students of class B Kindergarten in the city of Semarang. The sample was determined using a multistage random sampling technique.

Multistage Random Sampling in a procedural manner, according to Handini, In the first stage the population is divided into groups known as the primary group, then the primary group sample is drawn. From the primary group, the sample is divided into secondary groups, then a second group sample is drawn with a sampling method that is usually different from the previous sampling method. divided again depending on the number of stages desired. Multistage random sampling can consist of more than two stages and can also involve a combination of several sampling methods.

RESULTS AND DISCUSSION

The data of this study used three types of variables, namely the dependent variable, the independent variable/treatment, and the attribute variable. The dependent variable in this study was the preliminary counting ability. The independent/treatment variable in this study was a play activity

consisting of playing blocks and role-playing. The attribute variable in this study is a cognitive style consisting of a field-independent cognitive style and a field-dependent cognitive style.

After going through the treatment, namely playing activities, the results of the initial numeracy ability are obtained. The data set on the initial numeracy ability of each group will then be used as material for analysis, as in the following table:

Table 2. Data Description Initial counting ability

Cognitive Style	Playing Activities		Total
	Beam (A1)	*Role* (A2)	
Field Independent (B1)	$\sum$ = 11 $\sum$ = 858 $\sum$ = 66966 $\sum$ = 42 = 78	$\sum$ = 11 $\sum$ = 808 $\sum$ = 59482 $\sum$ = 130.73 = 73.45	$\sum$ = 22 $\sum$ = 1666 $\sum$ $\sum$ = 172.73 = 151.45
Field Dependent (B2)	$\sum$ = 11 $\sum$ = 810 $\sum$ = 59682 $\sum$ = 36,545 = 73.64	$\sum$ = 11 $\sum$ = 816 $\sum$ = 60674 $\sum$ = 141.64 = 74.2	$\sum$ = 22 $\sum$ = 1626 $\sum$ $\sum$ = 147.8
Total	$\sum$ = 22 $\sum$ = 1668 $\sum$ = 126648 $\sum$ = 78.55 = 151.64	$\sum$ = 22 $\sum^{YY}$ = 1264 $\sum^{Y^2Y^2}$ = 120156 $\sum^{y^2y^2}$ = 272.4 $\bar{x}\bar{x}$ = 147.64	$\sum^{n_t\ n_t}$ = 44 $\sum^{YY}$ = 3292 $\sum^{Y^2Y^2}$ $\sum^{y^2y^2}$ $\bar{x}\bar{x}$ = 74.82

1. Normality test

The data normality test is carried out to determine whether the sample comes from a normally distributed population. Then a normality test is carried out using the Lilliefors test. The data normality test conditions, namely H0 are accepted if Lcount <Ltabel and H0 are rejected if Lcount> Ltabel.

The formulation of the hypothesis is as follows:

H0 = The sample comes from a normally distributed population

H1 = The sample comes from a population with an abnormal distribution

Based on the results of data normality calculations in all research groups, it is known that the Lcount for all groups is smaller than Ltable, this means that all study groups are normally distributed. The results of the calculation of the normality test with the Lilliefors test as a whole can be seen in the following table:

Table 3. Recapitulation of Sample Normality Test Results with the Lilliefors Test at the level of α = 0.05

Group	Number of Samples	Lcount (L0)	Ltable (Lt: α = 0.05)	Conclusion
A1	22	0.109	0.19	Normal
A2	22	0.137	0.19	Normal
B1	22	0.097	0.19	Normal
B2	22	0.147	0.19	Normal
A1B1	11	0.136	0.25	Normal
A1B2	11	0.168	0.25	Normal
A2B1	11	0.104	0.25	Normal
A2B2	11	0.136	0.25	Normal

2. Homogeneity Test

In this study, the variant homogeneity test used the Bartlett test which was carried out on two groups of treatment variable data, namely the variant homogeneity test in groups A1 and A2 (playing activities), two groups of attribute variable data, namely the variant homogeneity test in groups B1 and B2 (cognitive style) and The four groups of cell data in the experimental design were the variance homogeneity test of the A1B1, A1B2, A2B1, and A2B2 groups.

The recapitulation of the results of the calculation of the homogeneity test of data using the Bartlett test where X2 count ≤ X2 table at the significance level α = 0.05 for the three groups above can be seen in the following table:

Table 4. Recapitulation of Homogeneity Tests in Groups Research Using the Bartlett Test

No.	Sample Group	X2 count	X2 table (α = 0.05)	Conclusion
1	Groups A1 and A2	0.86	3.84	Homogeneous
2	Groups B1 and B2	1.13	3.84	Homogeneous
3	Groups A1B1, A1B2, A2B1 and A2B2	7.34	7.82	Homogeneous

From the results of testing the normality and homogeneity of research data, it can be concluded that the data comes from a population that is normally distributed and homogeneous so that it can be continued with hypothesis testing.

A. **Hypothesis test**

Hypothesis testing in this study was carried out using a two-way analysis of variance (ANAVA). Two-way analysis of variance is used to examine the main effect, interaction effect, and simple effect between playing activities and cognitive styles on the initial numeracy skills in Kindergarten.

Furthermore, if the results of these calculations indicate an interaction between play activities and cognitive styles on the initial numeracy ability, then the calculation is carried out using the Tukey test formulation.

Based on calculations that have been done manually using two-way ANOVA analysis is obtained as in the table below:

Table 5. Results of Analysis of Variance Using Two-Way ANOVA

Source of variance	JK	Db	RJK	Fcount	Ftable	
					α = 0.05	α = 0.01
Among	44	1	44	5.02	4.08	7.31
Between B	36.36	1	36.36	4.15	4.08	7.31
AXB interaction	71,723	1	71,273	8,12	4.08	7.31
In	350,909	40	8.77			
Total	505,545	43				

Information:
db: degrees of freedom
JK: sum of squares
RJK: the average number of squares

The test criteria used are rejected H0 if Fcount> Ftable.

Based on the results of the two-way analysis of variance (ANOVA), hypothesis testing can be explained as follows:

1. Main Effect

a. From the analysis, it is known that the value of F (OA) = 5.02. Based on Ftable at db (A) / db (D) = 1/32 and α = 0.05, it is known that the value of Ftable = 4.08. Because F (OA) = 5.02> Ftable = 4.08 or H0 is rejected, so there is a difference in the average initial numeracy ability between groups of students who are given block playing activities and groups of students who play roles.

b. From the analysis, it is known that the value of F (OA) = 4.15. Based on Ftable at db (A) / db (D) = 1/32 and α = 0.05, it is known that the value of Ftable = 4.08. Because F (OA) = 4.15> F table = 4.08 or H0 is rejected, so there is a difference in the average initial numeracy ability between a group of

students who have a field-independent cognitive style and a group of students who have a field-dependent cognitive style.

2. Interaction Effect

From the analysis, it is known that the value of F (OA) = 8.12. Based on Ftable at db (A) / db (D) = 1/32 and α = 0.05, it is known that the value of Ftable = 4.08. Because F (OA) = 8.12> Ftable = 4.08 or H0 is rejected, so there is a significant interaction effect between factor A (playing activities) and factor B (cognitive style) on the initial numeracy ability.

From the results of the analysis, there is an interaction, it is necessary to carry out further tests with the Tukey test:

Table 6. Recapitulation of Tukey's Test Results

Comparison Group	N	Qcount	Qtabel (α = 0.05; k = 4; n = 11)
A1B1 and A2B1	11	5.1	4.26
A1B2 and A2B2	11	0.61	4.26
A1B1 and A1B2	11	4.89	4.26
A2B1 and A2B2	11	0.89	4.26

Based on the results of calculations that have been done, it can be concluded that the hypothesis testing is as follows:

1. First Hypothesis

The ability to count early in the group of students who were given block play activities was higher than in the group of students who were given role-playing activities.

This hypothesis is accepted based on the results of data calculations using two-way ANOVA using the testing criteria H0 (H0: μA1 ≤ μA2) is rejected and H1 (H1: μA1> μA2) is accepted at α = 0.05. Based on the results of the two-way ANOVA calculation, it is known that the value of Fcount = 5.02> Ftable 4.08 which means that H0 is rejected and H1 is accepted at α = 0.05. Thus it can be concluded that the initial numeracy ability of the group of students who were given block playing activities was higher than the initial numeracy ability of the group of students who were given role-playing activities.

2. Second Hypothesis

The ability to count early in the group of students who had a field-dependent cognitive style was higher than the group of students who had a field-dependent cognitive style.

This hypothesis is accepted based on the results of data calculations using two-way ANOVA using the testing criteria H0 (H0: μA1 ≤ μA2) is rejected and H1 (H1: μA1> μA2) is accepted at α = 0.05. Based on the results of the two-way ANOVA calculation, it is known that the value of Fcount = 4.15> Ftable =

4.08 which means that H0 is rejected and H1 accepted at α = 0.05. Thus it can be concluded that The initial numeracy ability of the group of students who had the Independent field cognitive style was higher than the group of students who had the dependent field cognitive style.

3. Third Hypothesis

There is an influence of the interaction between play activities and cognitive styles on students' initial numeracy skills.

This hypothesis was accepted after it was obtained through the results of data calculations using two-way ANOVA using the testing criteria H0 (H0: A × B = 0) was rejected and H1 (H1: A × B ≠ 0) was accepted at α = 0.05 based on the ANOVA calculation results. two ways it is known that the value of Fcount = 16.14> Ftable = 4.08, which means that H0 is rejected and H1 is accepted at α = 0.05. This means that there is a significant interaction between play activities and cognitive style on initial numeracy skills.

4. Fourth Hypothesis

The ability to count early in the group of students who have an independent field cognitive style and who are given cube activity is higher than the group of students who are given role-playing activities.

This hypothesis was accepted after it was obtained through the results of data calculations using two-way ANOVA using the testing criteria H0 (H0: μA1B1 ≤ μ A2B1) was rejected and H1 (H1: μ A1B1> μ A2B1) was accepted at α = 0.05. In addition, the average score of the initial numeracy ability of students who were given playing blocks and those who had the independent field cognitive style (A1B1) was 78 higher than the average score of the initial numeracy skills of students who were given role-playing activities and had a cognitive style field. independent (A2B1) of 73.45. So based on the results of further test calculations with Tukey's test, the value of Qcount = 5.1> Qtable = 4.26 which means that H0 is rejected and H1 is accepted at α = 0.05.

Thus it can be concluded that the ability to count early in the group of students who were given the activity of playing blocks and who have a cognitive style *independent field* higher than the initial numeracy ability of the group of students who were given role-playing activities and had an independent cognitive style field.

5. Fifth Hypothesis

The ability to count early in the group of students who were given playing blocks and had a field-dependent cognitive style was lower than the group of students who were given role-playing activities and had a field-dependent cognitive style.

This hypothesis was accepted after it was obtained through the results of data calculations using two-way ANOVA using the testing criteria H0 (H0: μA1B2 ≥ μA2B2) was rejected and H1 (H1: μ A1B2 <μ A2B2) was accepted at α = 0.05. Also, the average score of preliminary numeracy skills in students who are given playing blocks and have a field-dependent cognitive style

(A1B2) is 73.64 lower than the average score of preliminary arithmetic abilities in students who are given role-playing activities who have a cognitive style. field dependent (A2B2) of 74.18. So based on the results of the calculation of further tests with Tukey's test, the value of Qcount = 0.61 <Qtable = 4.26 which means that H0 is rejected and H1 is accepted at α = 0.05.

Thus it can be concluded that the initial numeracy ability of the group of students who were given playing blocks and had a field-dependent cognitive style was lower than that of the group of students who were given role-playing activities had a field-dependent cognitive style.

6. Sixth Hypothesis

The ability to count early in the group of students who had a field-independent cognitive style and who were given block playing activities was higher than that of the group of students who were given block playing activities and had a field-dependent cognitive style.

This hypothesis was accepted after it was obtained through the results of data calculations using two-way ANOVA using the testing criteria H0 (H0: μA1B1 ≤ μ A1B2) was rejected and H1 (H1: μ A1B1> μ A1B2) was accepted at α = 0.05. In addition, the average score of preliminary counting skills in students who were given block playing activities and those who had an independent field cognitive style (A1B1) was 78 higher than the average score of students who were given block playing activities and those who had a field cognitive style. dependent (A1B2) of 73.64. So that based on the results of the calculation of the follow-up test with Tukey's test, the value of Qcount = 4.89> Qtable = 4.26 which means that H0 is rejected and H1 is accepted at α = 0.05.

Thus it can be concluded that the ability to count early in the group of students who were given the activity of playing blocks and had a cognitive style *independent field* higher than the initial numeracy ability of the group of students who were given block playing activities and had a field-dependent cognitive style.

7. Seventh Hypothesis

The ability to count early in the group of students who were given role-playing activities and had a cognitive style in the independent field was lower than that in the group of students who were given role-playing activities and had a field-dependent cognitive style.

This hypothesis was accepted after it was obtained through the results of data calculations using two-way ANOVA using the testing criteria H0 (H0: μA2B1 ≥ μA2B2) was rejected and H1 (H1: μ A2B1 <μ A2B2) was accepted at α = 0.05. Also, the average score of preliminary numeracy skills in students who are given role-playing activities and who have independent field cognitive style (A2B1) is 73.45 lower than the average score of preliminary numeracy skills in students who are given role-playing activities who have a style cognitive field dependent (A2B2) of 74.18. So based on the results of the

calculation of further tests with Tukey's test, the value of Qcount = 0.89 <Qtable = 4.26 which means that H0 is rejected and H1 is accepted at α = 0.05

Thus it can be concluded that the initial numeracy ability of the group of students who were given role-playing activities and had a field-independent cognitive style was lower than the initial numeracy ability of the group of students who played role having a field-dependent cognitive style.

CONCLUSIONS

Based on the results of research and discussion, it is concluded that:

1. The initial counting ability of the group of students who played blocks was higher than the initial numeracy ability of the group of students who played the role. This is based on the two-way ANOVA calculation which shows that the value of Fcount (5.02)> Ftable (4.08) at the significance level α = 0.05, then H0 is rejected and H1 is accepted.
2. The initial counting ability of the group of students who had a field-independent cognitive style was higher than that of a group of students who had a field-dependent cognitive style. This is based on the two-way ANOVA calculation which shows that the value of Fcount (4.15)> Ftable (4.08) at the significance level α = 0.05, then H0 is rejected and H1 is accepted.
3. There is an interaction effect between play activities and cognitive style on initial numeracy skills. This is based on the two-way ANOVA calculation which shows that the value of Fcount (8,12)> F table (4.08) at the significance level α = 0.05, then H0 is rejected and H1 is accepted, meaning that the relationship between play activities and cognitive style affects the initial numeracy ability.
4. The ability to count early in the group of students who had an independent field cognitive style who played blocks was higher than the group of students who played roles. This is based on the calculation of further tests carried out using the Tukey Qcount test (5.1)> Q table (4.26) with a significance level of α = 0.05, then H0 is rejected and H1 is accepted.
5. The ability to count early in the group of students who had a field-dependent cognitive style who played blocks was lower than the group of students who played roles. This is based on the calculation of further tests carried out using the Tukey Q count (0.61) <Q table (4.26) with a significance level of α = 0.05, then H0 is rejected and H1 is accepted.
6. The ability to count early in the group of students who played blocks who had a field-independent cognitive style was higher than the group of students who had a field-dependent cognitive style. This is based on the calculation of further tests carried out using the Tukey Q count (4.89)> Q table (4.26) with a significance level of α = 0.05, then H0 is rejected and H1 is accepted.
7. The ability to count early in the group of students who played roles who had a field-independent cognitive style was lower than that in the group of students who had a field-dependent cognitive style. This is based on the calculation of further tests carried out using the Tukey Q count (0.89) <Q

table (4.26) with a significance level of $\alpha = 0.05$, then H0 is rejected and H1 is accepted.

REFERENCES

Adele Pillitteri, Maternal & Child Health Nursing: Care of the Childbearing & Childrearing Family, China: Library of Congress Cataloging in Publication Data, 2010

Ann Miles Gordon and Kathryn Williams Browne, Beginnings and Beyond, Foundations in Early Childhood Education, Eight Edition, Belmont, Wadsworth, 2008

Audrey Curtis, A curriculum for the pre-school child *Learning to learn, Second edition,* London, Routledge, 1997

Bedard, Joanne M. 2002. Effect Of a Multy-Sensory Approach on Grade One Mathematics Achievement. http://www.touchmath.com/pdf/JMB.pdf (accessed 11/06/2014)

Bernadette Duffy, Supporting Creativity and Imagination in the Early Years 2nd, London Open University Press

Boyoung Park, et.al, Young Children's Block Play, and Mathematical Learning Journal of Research in Childhood Education Vol. 23, No. 2, 2008.

Bredekamp, Sue and Copple, Carol Depelopmentally Apriorite Practice in Early Childhood Program, USA NAECY.

Calvin C. Clawson, The Mathematical Traveler Exploring the Grand History of Numbers US, Springer Science Business Media, LLC, 1999.

Charlesworth, R., & Lind, KK Math and science for young children 6th ed, Belmont, CA: Wadsworth, Cengage Learning, 2009.

Conny R. Semiawan, Learning, and Learning at Early Age, Jakarta, PT. Prenhalindo, 2002.

Desmita, Student Developmental Psychology, Bandung: Youth Rosdakarya, 2010.

Directorate of Early Childhood Education, Ministry of National Education Guidelines for Approach (BBCT) in PAUD, Dirjen Dikdasmen, Jakarta, 2006.

Directorate of Kindergarten and Elementary School Development, Ministry of National Education Guidelines for Learning Early Counting Games in Kindergartens, Dirjen Dikdasmen, Jakarta, 2007

Djaalidan Pudji Muljono, Measurement in Education, Jakarta, PT. Grasindo, 2008

Ece Özdogan, Play, mathematic and mathematical play in early childhood education, (Turkey, Ankara University, Educational Science Faculty, Ankara)

Erik H. Erikson, Childhood and Society, London, PALADIN GRAFTON BOOKS, 1993

Eva L. Essa, Introduction to Early Childhood Education 6th edition, Annotated Student's Edition, New York, Wadsworth, 2009

Family Child Care Academy, Early Numeracy - Basic Math Concepts, (http://familychildcareacademy.com/early-numeracy-basic-math-concepts/)

Family Learning, Numeracy, (http://www.familylearning.org.uk/numeracy.html)

Faridah Ariyani, *Role-playing methods to improve 1-10 numeracy skills in oup A children of Harapan Bunda Islamic Kindergarten Surabaya* http://ejournal.unesa.ac.id/indeks-php/paud-teratai/article/view/3051

Frost, J. et. al. Play and child development 3rd Ed. Upper Saddle River, NJ: Prentice-Hall, 2007

Globe, Frank, Third School: Humanistic Psychology Abraham Maslow, Yogjakarta: Kanisius, 1987

Hamzah B Uno, A New Orientation in Learning Psychology, Jakarta: Earth literacy, 2008

Hainstock, G. Elizabeth, Teaching Montessori in the Home: The School Years, New York, Random House, 1999

H. Douglas Brown, Language Assessment: Principles and Classroom Practices, White Plains NY: Pearson Education, 2004

Hilda L. Jackman, Early Education Curriculum A Child's Connection To The World5THNEW YORK, Wadsworth, 2009

Hohmann, M., Weikart, DP, & Epstein, AS Educating young children: Active learning practices for preschool and child care programs 2nd ed (Belmont, CA: Wadsworth, Cengage Learning, 20

Ivy Schousboe and DitteWinther-Lindqvist, Introduction: Children's Play and Development in Children's Play and Development Cultural-Historical Perspectives, New York, Springer, 2013

J.Birckmayer, Dramatic play; Pll be the Memory and You be the Doe (http://betterkidcarc.psu.edu/angelunits/onehour/dramaticplay/dramaticlesson.htl,2004

James Hartley, Learning and Studying: A Research Perspective Psychology cus Taylor & Francis Routledge, 1998

Jennifer M. Young-Loveridge, Effects on early numeracy of a program using number books and games, University of Waikato, Early Childhood Research Quarterly Volume 19, 2004

Jeremy Kilpatrick and Jane Swafford, Helping Children Learn Mathematics, Nation Academy Press, Washington DC, 2002

John Threlfall, Development In Oral Counting, Enumeration And ounting For Cardinality in Teaching And Learning Early Number Edited by Ian Thompson NEW YORK, Open University Press, 2008

John W Santrock, Educational Psychology, Translated by Tri Wibowo BS, Educational Psychology, Jakarta: Kencana, 2008

Laura E. Berk, Child Development, Seventh Edition, NEW YORK, Pearson, 2006

Lestari KW, Mathematical Concepts for Early Childhood, Directorate of Early Childhood Education Development, Ministry of National Education, 2011

Li-fang Zhang et al., Intellectual Styles: Challenges, milestones, and Agenda: Handbook of Intellectual Styles Preferences in Cognition, Learning, and Thinking, edited by Li-fang Zhang et al., NY, Springer Publishing Company, 2012

Maaike Lauwaert, The Place of Play Toys and Digital Cultures, (Amsterdam, Amsterdam University Press, 2009

Maima A, et.al. The Effectiveness of Role-Playing Method in increasing the ability of Early Childhood Mathematical Concepts in Kindergartenhttp://www.kdcibiru.upi.edu/jurnal/index.phd/antologipaud/article/view/153 (accessed 14/06/2014)

Marilyn Curtain-Phillips, M. Ed, The Causes and Prevention of Math Anxiety, http://www.mathgoodies.com/articles/mathanxiety.html, (accessed April 2014)

Mark Tennant, *Psychology and adult learning, third edition*.London: Routledge, 2006

Mayke Tedjasaputra, Play, Toys, and Games for Early Childhood Education, Jakarta, PT. Gramedia Widia Sarana Indonesia, 2001

Mayza, Brain Stimulation in Early Childhood, Seminar and National Workshop on PUD UNJ, Jakarta from 8-12 October 2004.

Melanie Ayres and Leslie D. Levé, *Gender Identity and Play in Play From Birth to Twelve, Contexts, Perspectives, and Meanings, Second Edition, edited by Doris Pronin Fromberg and Doris Bergen*, New York, Routledge, 2006

Mildred B. Parten, Social participation among preschool children, University Of Minnesota, *Journal of Abnormal and Social Psychology* 28

Myrnawati Crie Handini, Research Methodology for Beginners, Jakarta: FIP Press, 2012

Mukhtar Latif et.al, New Orientation of Early Childhood Education (theory and application), Jakarta, Kencana Prenada Media Group, 2013

Neville Bennett et.al, Teaching Through Play, Teachers' thinking and classroom practice Bucingham, Open University Press, 2001

OCED, PISA 2012 Results In Focus What 15-Year-Olds Know And What They Can Do With What They Know, Organization for Economic Co-operation and Development, 2013

Olivia N. Saracho, Teachers 'and students' cognitive styles in early childhood education, London, Bergin & Garvey, 1997

Peter Smith. Children And Play: *Understanding Children's Worlds,* UK: Wiley-Blackwell, 2010

Peter Westwood, What Teachers Need to Know About Numeracy, Australian Council for Educational Research Ltd, Acer Press, 2008

Pound, Linda. Thinking and Learning About Mathematics in the Early Years, (New York, Routledge: Open University Press, 2008

Pre School (downloaded: http://www.westmeathchildcare.ie/publications/booklet.pdf)

QCA, Curriculum Guidance for the Foundation Stage, London, Qualifications and Curriculum Authority, 2000

Reudene E. Wilburn, Understanding the Preschooler, New York, PETER LANG, 2000

R. Charlesworth & KK Lind, Math and Science For Young Children 6th Edition, Belmont, CA, Wadsworth, Cengage Learning, 2009

Robert J. Wright, et. al, Early Numeracy Assessment for Teaching and Intervention Second Edition, London, Paul Chapman Publishing, 2006

Robin Barrow, Plato, Utilitarianism And Education, NEW YORK, Routledge Library Editions, 2011

Ruth Wilson, Nature and Young Children Encouraging creative play and learning in natural environments, NEW YORK, Routledge, 2008

Learning Model Series in Kindergarten, Guidelines for Learning Beginning Counting Games in Kindergartens, Directorate of Kindergarten and Elementary School Development, 2007

Soegeng Santoso. The Concept of Early Childhood Education According to the Founder Jakarta: UNJ, 2009

Susan Feez and Montessori, Montessori And Early Childhood, London, SAGE Publication Ltd, 2010

Terry Musser, *Individual Differences: How Field Dependence-Independence Affects Learners,* http://www.personal.psu.edu/staff/t/x/txm4/paper1.html (accessed: 10/06/2014)

Texas School for the Blind and Visually Impaired, Teaching Mathematical Concepts,http://s22318.tsbvi.edu/mathproject/ch1.asp#main,(accessed: 10/06/2014)

Westmeath County Childcare Committee, Inspiring Literacy & Numeracy Development in Pre-school, http://www.westmeathchildcare.ie/publications/booklet.pdf

Witkin, et al., Field dependent and field-independent cognitive styles and their educational implications, Review of Educational Research (47: 1), 1977

The Effect Play Activity And Cognitive Styles Towards Early Numeracy Ability (An Experimental Study At Kindergarten In Semarang City, 2014)

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