

THE EFFECTIVENESS OF THE PLAY METHOD AGAINST BEGINNING CALCULATION ABILITY

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ABSTRACT

Early numeracy skills are very important for children because this ability will prepare children to be able to attend basic education and make it easier for children to enter their daily lives. Early numeracy learning must start early, namely in Kindergarten. The reality on the ground, Kindergarten teachers have not made maximum use of existing learning media and emphasise teacher-centred learning. This results in the concept of learning to count early in early childhood do not go as expected because learning becomes less interesting and boring for children. This study aimed to compare the effectiveness of two playing methods, namely the block playing method and the role-playing method. This research is an experimental study with a static group comparison design. Respondents in this study were kindergarten students aged 4 to 6 years, totalling 30 students. The hypothesis in this study is that there is a difference in initial numeracy skills between students who are given the block playing method and students who are given the role-playing method. Based on the calculation results obtained, $t = 2.346$ with $p = 0.026$; thus, H_0 is rejected at the sig level. 5%. This study found that the initial numeracy ability of the group of children who played with blocks was higher than that of the group of children who played the role. The hypothesis in this study is that there is a difference in initial numeracy skills between students who are given the block playing method and students who are given the role playing method. Based on the calculation results obtained $t = 2.346$ with $p = 0.026$ thus H_0 is rejected at the sig level. 5%. This study found that the initial numeracy ability of the group of children who played with blocks was higher than that of the group of children who played the role. The hypothesis in this study is that there is a difference in initial numeracy skills between students who are given the block playing method and students who are given the role playing method. Based on the calculation results obtained $t = 2.346$ with $p = 0.026$ thus H_0 is rejected at the sig level. 5%. This study found that the initial numeracy ability of the group of children who played with blocks was higher than that of the children who played the role.

Keyword: block playing method, role-playing method, beginning numeracy skills

INTRODUCTION

In everyday life, reading, writing, and arithmetic always appear in almost all work activities from when children enter school until The end of life. This causes high parents' expectations of the school, especially in Kindergarten. Their children from the beginning of enlisting a master listing skills, namely reading, writing and arithmetic. Many elementary schools require listing basic skills when joining the first grade of elementary school. According to Yusuf (2003), compared to

reading and writing, learning to count is the type of difficulty that is more experienced by students.

The Golden Age is from birth until the child will enter basic education, never be repeated. According to Santrock (2004), early childhood is at the golden age (*Golden Age*) in all aspects of its development. This period is also called the critical period of development (critical period), also called the window of learning (windows of learning). At this time, stimulation is needed by children to develop all their

potential optimally. Therefore, the role of parents and teachers in providing positive and appropriate stimulation or stimulation at this critical The period will increase the entire potential of early childhood, which will be beneficial for children in the future. Providing stimulation or stimulation too early childhood should be carried out continuously and continuously according to age levels.

Preschool age, or what is currently known as Early Childhood, is the most effective age for developing various potentials that children have, stimulating the ability to count to minimise the impact of learning difficulties in counting on further Education programs. This is in line with what was stated by Robert E Slavin (2009) that programs that emphasise stimulation to infants, parental training, and other services for children from birth to the age of five years were also found to have long-term effects on students' school success. which is at risk.

Depdiknas (2000) states that numeracy is a part of mathematics needed to develop numeracy skills that are very useful for everyday life, especially the concept of numbers Which is the basis for developing mathematical abilities. So that the ability to count is a prerequisite for children to understand Mathematics, the Ministry of National Education (2000) states that the general purpose of counting in Kindergarten is for children to know the basics of learning to count so that children will be more ready to take counting lessons at the next very complex level. The introduction of counting in Kindergarten can be interpreted as an activity introducing counting using objects.

Based on a preliminary study conducted by the author at Kindergarten / PAUD (Early Childhood Education) in the East Jakarta area, the author sees the fact that children's ability to count and sort symbols of numbers is still very low, as well as by connecting symbols of numbers with some objects. Still not done well. This low ability is thought to be one of the reasons for learning media that are less attractive to children. In essence, children like to play, and of course, the forms of games that include learning elements in them will attract children's interest to do so and indirectly by playing the children also learn something. Therefore,

According to Froberg (Dockett & Flear, 2000)at the age of 4-6 years for a child learning

is playing and playing is learning. This means that through playing, children feel a sense of happiness and joy, and through playing is also a means that allows children to develop optimally. Playing also gives children the freedom to imagine, explore and create things (Catron and Allen, 1999). Therefore, playing activities cannot be separated from the child so that the learning activities carried out must refer to the learning principles, namely "play while learning" and "learning while playing" with the aim of giving children a sense of pleasure so that playinG while learning allows children to develop independently. Optimally and children use play activities to test ideas, find relationships, abstract information, express feelings and ideas, define themselves and develop relationships with their group (Stone, 1993). Therefore, in introducing early childhood numeracy learning activities, teachers need to pay attention to appropriate teaching methods for children in the early childhood play activity program.

This research was conducted in two Kindergartens in Jakarta, where the play method has not taught early counting. The first Kindergarten uses the block play method to teach early arithmetic and the second Kindergarten uses the role-play method.

The ability to count early or early is the basic numeracy ability possessed by every child-related to numbers, addition, subtraction and division. This initial numeracy ability can increase according to the child's developmental level. This is in line with what was conveyed through some literature, among others, Pound (2008) defines numeracy as an ability that involves confidence and competence with numbers and measurements, which involves: An understanding of the number system; Skills in calculating numbers; Tendency and ability to solve number problems in a variety of contexts; Practical understanding of the ways in which information is collected and presented; Reasoning: using logic to explain and justify solutions to problems or to extend from the known to the unknown; Doing: seeing mathematics as reasonable, useful, and usable in work and everyday life. according to Glover (2007) arithmetic or counting deals with adding, subtracting, multiplying and dividing numbers. All of these elements in counting are widely used in everyday life such as when shopping,

distributing food, measuring objects or distances and many other things.

Early counting for early childhood should be carried out through three stages, namely the first stage of mastering the concept, the secondly the transition period, and then introducing symbols (Depdiknas 2000). Mastery of Concepts is understanding and understanding something by using concrete objects and events, such as recognising shapes, colours, and counting numbers. While the Transition Period is a thinking process that is a transition period from concrete understanding to the introduction of abstract symbols, where the concrete objects still exist, and the shape of the symbols is introduced. The teacher does this in stages according to the pace and speed of the children's different abilities (individually). For example, when the teacher explains the concept of one by using an object (a pencil), then the children can then mention other objects that have the same concept, as well as introduce the shape of the symbol of the number one.

The benefits of learning to count as early as possible in children according to Montolalu (2005) are:

1. Can optimize brain function. Early numeracy learning has proven to be very useful in optimizing brain functions, especially the right brain, which includes the power of analysis, memory, logic, vision, independence, perseverance, discovery and application. This basic ability is an ability in the exact field and will be very useful in everyday life
2. Train imagination and creativity, logic, systematic thinking, concentration and memory. This is achieved by training the left and right brain to be more active through learning to count
3. Can increase speed, accuracy and accuracy in thinking
4. Become more sensitive to spatial arrangement due to the influence of abacus imagining in our brain

So, by providing early numeracy learning activities through playing from an early age, it will have a positive impact on the development of children's brain functions and provide opportunities for children to be imaginative and creative.

In general, early counting for early childhood has the aim of being able to know the basics of learning to count so that in time the

child will be better prepared to take numeracy learning at the next more complex level of education. While the purpose of early counting for early childhood in particular is so that children can think logically and systematically from an early age through observation of concrete objects, pictures or numbers that are around and children can adjust and involve themselves in social life. who in their daily life require the ability to count, accuracy, concentration, abstraction and higher appreciation power, have an understanding of the concepts of space and time and can estimate possible sequences according to events that occur around them,

Play is a child's world, a world where children fill all their activities by playing because basically early childhood has not been able to distinguish between playing, studying and working. They really enjoy playing and will do so whenever they can. Jackman (2009) defines play as a self-motivating behavior. Freedom to choose the process and fun is a natural activity for children. According to Mayesky (2009) Playing with children is a natural and best way for children to learn because in play activities they investigate and observe themselves and others. So through playing children can channel all their desires and satisfaction, through playing also children can do physical activities, learn to get along with peers and foster positive attitudes and increase vocabulary and can stimulate the development of all potential intelligence of children.

Smilansky (Ayres, et al.,2015) divides the game into four types, including: (1) Functional play: repetitive muscle movement, the main purpose of which is the movement of objects, (2) Constructive Play: making or building something from objects (3) Role Playing: playing or engaging in make-believe or pretend play. (4) Game with rules: admit, accept, and comply with the previously described rules. In this study, the play activities that will be studied are block playing and role playing.

Beams are three-dimensional shapes formed by three pairs of squares or rectangles with at least one pair of different sizes. A block has 6 sides, 12 edges and 8 corners. The block formed by six congruent squares is called a cube (Johnson & Neili, 210)

According to Saracho, playing blocks describes children playing with small units of blocks, large blocks to build large structures, and block accessories to add content to construction. When children play with blocks their science and numeracy skills are honed. (Saracho, 1997). Through playing with blocks, children can express their abstract imagination into something concrete and get important concepts in solving arithmetic problems and so on. When building existing blocks, children are actually imitating what they see and observe in their daily lives, coupled with their own imagination and creation abilities. Playing blocks can improve arithmetic and science skills, especially those related to quantity, addition and subtraction, weight, and balance; develop vocabulary and visual memory related to shape, size, and pattern; generate creativity, problem solving, encourage cooperative play; and satisfying, giving a sense of accomplishment (Essa, 2009:304).

Role playing in general which is played in schools has several characteristics, namely: role playing is a theatrical play in which players play certain roles according to a written play and play it for entertainment purposes; Role playing plays patterns of behavior determined by social norms, and in role playing a child plays imaginative situations.

Saracho (1997) revealed that role playing describes how children pretend and act out of their daily circumstances, they act pretend they relate to their real life experiences such as homes, beauty salons, post offices, restaurants.. Educators believe that in role playing children learn a lot about the world in which they live (Curtis, 1997).

According to Rogers and Evans (2008), many abilities and skills can be improved through role playing, among others, children are able to improve socialization skills, develop fantasy, engage in various contexts, objects, numbers and letters, can increase a strong desire to interact, develop skills children in maintaining culture, developing the ability to express, develop intimacy between children and can increase children's curiosity about the themes being studied. So, through role playing, math skills, especially numeracy, can be improved, for example: the children pretended to be a merchant selling goods. Children can act as buyers, in playing they pretend to make transactions.

In general, the differences between block game activities and role playing activities can be distinguished as shown in the following table:

Table 1. Differences between Blocks and Role-playing Games

Block Games	Role Play
Students play mainly to play independently (parallel) but can also be done in groups, Not prioritizing cooperation and communication between children playing with each other In playing blocks, the focus is more on the game tools used Game tools are all types and sizes of blocks that are generally played by children in kindergarten The form of the game is to arrange, count and line up blocks according to the creations of each child	Students play together (cooperatively) Prioritizing cooperation and communication between playing children Prioritizing the role played by children. The game tools used are objects that are in school and are adapted to the theme of the story The form of the game is based on the theme and storyline that has been prepared by the teacher, and the children play based on the roles given.

Based on the differences in these characteristics, the research hypothesis was formulated. The hypothesis in this study is there

is a difference in initial numeracy skills between students who are given the block play method

and students who are given the role playing method.

RESEARCH METHODS

Research design

This research is a pre-experimental research. The experimental design in this study used the design *static-group comparison*. In this research, we will compare the early numeracy skills of children who are given block playing activities and role playing activities. The dependent variable in this study was the initial numeracy ability, while the independent variables which were also the treatment were block playing activities and role playing activities.

Research Subject

The subjects in this study were students of class B Kindergarten as many as 30 people who were selected randomly. A total of 15 people were subjected to block playing activities, and 15 others were subjected to role playing activities. Each treatment was carried out at a different school.

Treatment Design

The treatment design for those given the activity of playing blocks, namely:

- a. The researcher introduces the concept of playing blocks that will be used in the study to the teacher and teaches how to implement it.
 - b. The teacher provides play activities.
 - c. Teachers and researchers make observations during the playing process
 - d. Conducting an evaluation of initial numeracy skills after several playing activities.
- The treatment design for the group that was given role-playing activities were:
- a. The researcher introduces the concept of role playing which will be given in the study to the teacher and teaches how to implement it.
 - b. The teacher provides play activities.
 - c. Teachers and researchers make observations during the playing process
 - d. Conducting an evaluation of initial numeracy skills after several playing activities.

Research Instruments

Instruments for children's early numeracy skills is the initial arithmetic ability test developed by researchers based on the following topics and indicators:

1. The subject of number recognition. Consists of indicators:
 - a. Shows the symbol number 1 -1
 - b. Estimate the next sequence after seeing 4 consecutive patterns
 - c. Connect the concept of numbers and number symbols
 - d. Order the objects from largest to smallest
 - e. Counting objects and matching the symbols of the numbers
 - f. Creating various shapes using various objects according to the concept of numbers that the child knows, for example: making certain shapes from 5 sticks
2. The subject of the operation of numbers. Consists of indicators:
 - a. Group as many pairs of objects as possible
 - b. Recognize addition of 1-10
 - c. Recognizing 1-10 . subtraction
 - d. Recognize the concept of equal and unequal numbers,
 - e. Recognize the concept of more and less numbers,
 - f. Recognize the concept of many and few numbers
3. The subject of sorting, sorting, and classifying. Consists of indicators:
 - a. Grouping objects by shape
 - b. Grouping objects by size
 - c. Point out as many objects that have the same size
 - d. Point out as many objects that have the same shape
 - e. Name objects around them based on geometric shapes
 - f. Name, designate and group circles, triangles and rectangles
4. The subject of equating and Distinguishing. Consists of indicators:
 - a. Mention the difference in length using spans, rulers, etc
 - b. Show the difference in weight using a scale

Secondary Variable Control

Control of secondary variables that are thought to affect the results of the study is carried out by: (1) Elimination of other early counting teaching methods outside of treatment, (2) Balancing or constancy of place, time of implementation, instructor, level of intelligence of the subject.

Data analysis

This study aims to distinguish early numeracy skills between children who are given block playing activities and children who are given role playing activities. For this reason, the appropriate data analysis method is the independent sample t-test, which is a comparative analysis technique for unpaired data. Data analysis using SPSS software version 15.00.

RESEARCH RESULT

description

Based on the descriptive results of the research related to the gender of the respondents, the counting ability of the block playing group, and the numeracy ability of the role playing group, the following results were obtained:

Gender

Table 3. Gender

Gender	Σ	%
Man	15	50
Woman	15	50

The gender of the respondents in this study consisted of 15 people or as much as 50% male and 15 people or 50% female.

Block Play Group Counting Ability

Table 4. Counting Ability of Block Playing Group

	Counting Ability (Beams)
mean	71.93
median	70.00
mode	65.00
Variant	8.33
Standard Deviation	69.35
Minimum	61.00
Maximum	84.00

Based on the data that has been collected from the respondents as many as 15 students, the data obtained are students who play the block game with the highest score of 84, the lowest score of 61, the average of 71.93; median value 70; mode value 65; and standard deviation 8.33. Furthermore, a summary description of the group data is presented in a histogram graph as follows:

Figure 1. Counting Ability Ex. Block

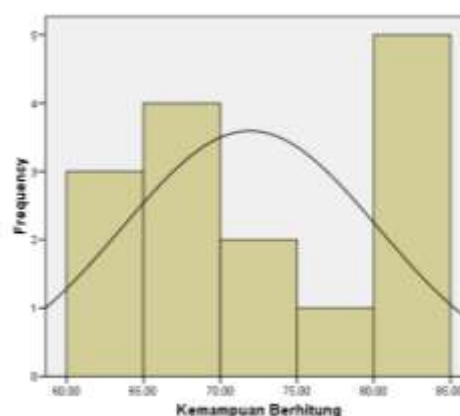


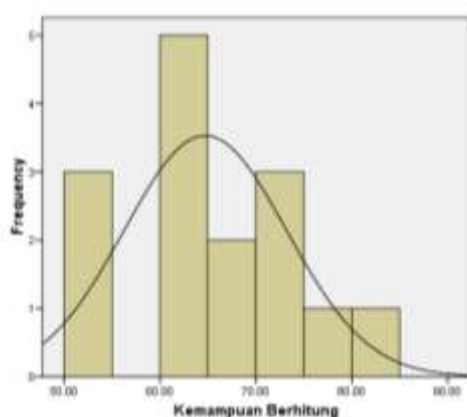
Table 5. Counting Ability of Role Playing Group

	Numeracy (Role)
mean	64.73
median	64.00

mode	54.00
Variant	8.48
Standard Deviation	71.92
Minimum	51.00
Maximum	81.00

Based on the data that has been collected from the respondents as many as 15 students, the data obtained for the group of students playing role-playing games with the highest score 81, lowest score 51, average 64.73; median value 64; mode value 54; and standard deviation 8.48. Furthermore, a summary description of the group data is presented in a histogram graph as follows:

Figure 2. Counting Ability Ex. Role



Inference

Based on the results of the independent sample t-test, the value of $t = 2.346$ with $p = 0.026$, through a significance level of 0.05, then H_0 is rejected and H_1 is accepted. Thus, it can be concluded that there is a difference in initial numeracy skills between the group of students who played blocks and the group of students who played the role. Where the group given the activity of playing blocks has a higher mean than the students who are given the activity of playing the role.

DISCUSSION

The findings in this study prove that the activity of playing with blocks will result in better initial numeracy skills than role-playing activities. This is very possible considering that in playing blocks students play independently (parallel) although it can also be done in groups, playing in this way makes students independent so that children have more personal responsibility to complete what is their task; in playing with blocks, cooperation and communication between children who play are not prioritized. This also helps children to focus more on completing their tasks; playing blocks is more focused on the game tools used, this of course makes students able to focus, game tools are all types and sizes of blocks that are usually played by children in kindergarten, the variation of the size and color of the blocks makes students trained to get used to counting in real life, the form of the game is to arrange; counting and arranging blocks according to the creations of each child, the variance of activities will make students not bored. Meanwhile, role playing activities focus more on communication and cooperation in carrying out their roles. So that it is more suitable for language development, as stated by Dhieni (Mustikawati, 2012) the purpose of implementing role playing activities in language development in Kindergarten aims to train comprehension, train children to speak fluently, train concentration power, train making conclusions, help development of intelligence, helps the development of fantasy, and creates a pleasant atmosphere.

While the findings of this study are in line with research conducted by Purwanti (2013) which found that using number blocks media could improve the numeracy skills of group B kindergarten students.

CONCLUSIONS & IMPLICATIONS

Based on the research findings, it can be concluded that initial numeracy skills are more effective if delivered through the block playing activity method compared to role playing activities.

From the conclusions of this study, it has implications, namely:

1. Implications for planning the selection of play activities by teachers. It is hoped that the

teacher before starting his learning activities should have a lot of skills in the learning method while playing for his students so that they can choose the learning method in this case the right play activity for students in introducing initial counting based on the findings of this study.

2. The implications for playing facilities, especially playing blocks to learn to count early. It is hoped that the teacher can make maximum use of the types and shapes of existing blocks to be able to make children more enthusiastic in playing while learning to start counting for Kindergarten students.

3. Implications for Researchers. It is hoped that with the findings of this study there will be more in-depth studies of other forms or types of play that can help students to learn early to be able to continue their education to a higher level.

SUGGESTION

With regard to the results of the discussion, limitations and conclusions obtained in this assessment, some suggestions can be made as follows:

1. For students
 - a. Development of Play Activities.

The world of children is the world of play, so that in developing children's cognitive abilities, the selection of the right type of play needs to be considered so that learning while playing activities can be more optimal.

b. The development of early numeracy skills in early childhood is largely determined by active the activity of children in understanding counting through play activities provided by the teacher. For this reason, it takes a lot of time and opportunity for children to play which can generate children's interest in counting through the block play program.

c. Teachers should be able to improve their creative abilities to design play activity programs that can give children high pleasure and interest in learning to count through their playing activities.

2. For Institutions

a. Institutions should be able to provide an opportunity for kindergarten teachers to follow the technical guidance of PAUD learning to be able to add insight into the teacher's thinking in increasing his creativity in choosing playing activities while learning for his students and

mastering better knowledge about child psychology such as children's learning styles (cognitive style). which the teacher needs to master.

b. Institutions can provide support for learning and play facilities that are more complete and better, such as the procurement of more diverse blocks and more complete and adequate role playing facilities.

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