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## **Developing Cognitive Skills in Number Recognition Through Picture Number Card Media in Early Childhood**

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### **Abstract**

*Cognitive abilities are the brain-based skills required to perform any task from the simplest to the most complex. Children's ability to recognize numbers requires thinking about objects, objects, or events. The aims of this study were: 1) To find out the teacher's planning in developing cognitive abilities in introducing numbers using picture number cards to student A at PAUD Permata Jember. 2) To find out the form of teacher implementation in developing cognitive abilities in introducing numbers with illustrated number cards media to group A students at PAUD Permata Jember. 3) To determine the teacher's evaluation in developing cognitive abilities in introducing numbers with illustrated number card media to group A students at PAUD Permata Jember. This research uses a qualitative approach with the type of case study research. This research used observation, interviews, and documentation as data collection techniques. Data analysis uses data condensation, data presentation, and data verification. In comparison, the validity of the data is used in triangulation techniques and data sources. Based on the study's results, 1) planning: Formation of themes, preparation of lesson plans, preparation of learning media, choice of teaching methods and materials to be implemented, and provision of information to students before learning activities. 2) Forms of implementation: opening activities, namely greetings, praying, and asking how students are doing; Second is the core activity, namely seating management, singing songs about number recognition, distributing illustrated number card media to students, implementing number recognition, students individually take turns demonstrating on the blackboard. Then, the third is the closing activity, namely, the teacher instructs (recalling) the repetition of today's learning activities, and the last is the closing activity of learning (praying). 3). evaluation, observation (observation), performance (assignment), and checklist.*

**Keywords:** developing cognitive abilities, introducing numbers, illustrated number card media.

### **Abstract**

Cognitive abilities are brain-based skills required to perform any task, from the simple to the most complex. A child's ability to recognize numbers requires thinking about objects, things, or events. The objectives of this paper are: 1) To describe the teacher's planning in developing cognitive abilities in introducing numbers with illustrated number card media in student A at PAUD Permata Jember. 2) To describe the implementation of the development of cognitive abilities in introducing numbers with the media pictorial number cards in group A students at PAUD Permata Jember. 3) To describe the evaluation of teachers in developing cognitive abilities in

introducing numbers with the media of illustrated number cards in group A students at PAUD Permata Jember. This research uses a qualitative approach with a case study type of research. This research used observation, interviews, and documentation as data collection techniques. Data analysis uses data condensation, data presentation, and data verification. At the same time, the validity of the data is used in triangulation techniques and data sources. Based on the research results, 1) planning: Establishing themes, preparing lesson plans, preparing learning media, choosing methods and teaching materials to implement, and providing information to students before learning activities. 2) Form of implementation: opening activities, namely greetings, praying, and asking how students are doing. Second is the core activity, namely managing seating, singing songs about number recognition, distributing illustrated number card media to students, and implementing number recognition; learners take turns demonstrating on the board. Then, the third is the closing activity, namely, the teacher instructs the recalling of today's learning activities, and the last is the closing activity of learning (praying). 3). evaluation, observation (observation), performance (assignment), and checklist.

**Keywords:** Developing Cognitive Skills, Recognizing Numbers, Picture Number Card Media.

## 1. Introduction

Early childhood is a group of unique children in the process of growth and development, meaning that it has the characteristics of physical, motor, cognitive, social, emotional, and language growth and development.<sup>1</sup> Early Childhood Education in the learning process has a program adapted to the child's age. It stimulates various aspects of child development, such as cognitive, physical motor, language, social, emotional, religious, and moral values.<sup>2</sup>

Early childhood education is a form of education that focuses on laying the foundation for physical growth and development (fine and gross motor coordination), intelligence (creative power and emotions), spiritual intelligence, social-emotional (attitude and behavior and religion), language, and communication, by the uniqueness and stages of development through early childhood.<sup>3</sup>

In early childhood education, one of the aspects that must be developed is the field of cognitive development. Providing educational stimulation is very important because 80% of brain growth develops in children from an early age. Then, the elasticity of early childhood brain development is more excellent at birth to before eight years of life. The remaining 20% is determined during life after childhood. The form of stimulation given should be appropriate according to the level of development.

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<sup>1</sup> Masitoh, *Kindergarten Learning Strategies* (Jakarta: Open University, 2011).

<sup>2</sup> Muhammad Fadlillah and Lilif Mualifatu Khorida, *Character Education in Early Childhood* (Yogyakarta: Ar-Ruzz Media, 2013).

<sup>3</sup> Hery Widodo, *Dynamics of Early Childhood Education* (Semarang: ALPRIN, 2019).

Cognitive development is intended so children can explore the world through their five senses. With the knowledge gained, children will be able to continue their lives and become human beings who are God's creatures and who must empower what is in this world for the benefit of themselves and others. Children's thinking skills can be used quickly and precisely through cognitive development to overcome a situation or solve a problem. The purpose of cognitive development is to develop children's thinking skills to process their learning gains, find various alternative solutions to problems, help children develop their mathematical logic skills and knowledge of space and time, and ability to sort, classify, and think carefully.<sup>4</sup>

Playing in preschool children is not just playing around but emphasizes playing while learning; one example is the media "Picture Number Cards," picture number cards directly involve children's activities during the learning process.

Introducing numbers means introducing the concept of writing or the shape of numbers.<sup>5</sup> Therefore, the implementation of early counting at PAUD Permata Jember is done in an exciting and varied way, one of which is with the media of illustrated number cards.

The word media is the plural form of the word *medium*. The medium can be defined as an intermediary or an introduction to communication from the sender to the recipient.<sup>6</sup> Meanwhile, according to the Education Association / NEA in AECT, media are all objects that can be manipulated, seen, heard, read, or talked about, as well as instruments used for these activities.<sup>7</sup>

Picture number cards are small cards that contain numbers, pictures, text, and symbols related to the picture; the size of the picture cards can be adjusted to the size of the class at hand. Children will contribute directly to making them more active in the learning process by using picture card media.

As for the benefits of using picture number cards in this study, one of them is to facilitate the teaching and learning process between teachers and children so that learning will be more effective and efficient.

Educators can use picture number cards as a learning game so children are not bored. For example, children can pair picture number cards with many objects, guess numbers, sort numbers, and classify colors.

What is meant in the title of this research is an effort or way for educators to try and find the best way for children. Teachers are tasked with educating, teaching, and guiding all school learning activities. The problem is that when teachers teach number recognition, some children struggle and need help with the concept of numbers and number shapes. For example, when

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<sup>4</sup> Masitoh, *Kindergarten Learning Strategies*.

<sup>5</sup> Emma Sovia, *Make Your Child an Expert: The* (Yogyakarta: DIVA Press, 2015).

<sup>6</sup> Daryanto, *Learning Media* (Bandung: PT. Sarana Tutorial Nurani Sejahtera, 2010).

<sup>7</sup> Nunuk Suryani, Achmad Setiawan, and Aditin Putria, *Innovative Learning Media and Its Development* (Bandung: Remaja Rosdakarya, 2018).

mentioning the number 3, children still struggle with writing the number. They also need help understanding when asked to show the symbol of the number mentioned. In addition, the lack of media variations used in learning activities causes children to feel bored when learning occurs.

Based on the results of interviews with principals and teachers at PAUD Permata Jember in group A, children show that developing the ability of students to introduce numbers is done by getting used to counting children repeatedly; if the child begins to lose concentration, then the teacher invites the child while singing. It is done by the teacher so that children are interested in learning and can recognize numbers. Teachers also provide guidance or encouragement so that children can complete their tasks.

There are several reasons underlying the research at PAUD Permata Jember as follows :

*First*, at PAUD Permata Jember, institutions develop cognitive abilities of number recognition in early childhood using unique media, namely illustrated number cards and exciting ways. Hence, children recognize numbers properly and correctly.

*Second*, learning about number recognition in group A students has yet to be maximized. Therefore, group A teachers at PAUD Permata Jember found an idea by teaching number recognition with illustrated number card media.

*Third*, many of the surrounding communities participated in enrolling their children in PAUD Permata Jember even though there were only a few teachers.

Therefore, the researcher here is interested in developing the teacher's ability to introduce numbers with picture card media, namely cards measuring 11 cm x 7 cm in the form of pictures and number symbols on the back, so that children do not feel bored in learning and also teach how to make children not have difficulty and are invited to count together with the picture card. For example, children can guess numbers, pair picture cards with many objects, and classify colors.

Based on the description above, The researcher was encouraged to conduct research titled "Developing Cognitive Ability to Recognize Numbers with Picture Number Card Media for Group A Students at PAUD Permata Jember."

## **2. Method**

This research method uses a qualitative approach with case study research because the results obtained are more holistic and in-depth. Qualitative research becomes the right 'research tool' if the desired result is a *thick description*. Qualitative research is also an option because the qualitative approach allows researchers to understand the context and meaning behind a phenomenon or event.

This research is located on Koptu Diamond Street, East Krajan neighborhood, precisely at PAUD Permata Jember, and the research was conducted from September 6 - October 18, 2020. The subjects in this study were principals, group teachers, and group A students at PAUD Permata Jember. While the object of research is the planning of teachers in developing cognitive abilities in recognizing numbers with pictorial number card media, the implementation of teachers in developing cognitive abilities in recognizing numbers with pictorial number card media, as well as teacher evaluation in developing cognitive abilities in recognizing numbers with pictorial number card media in group A students at PAUD Permata Jember. This research method uses observation, interview, and documentation techniques. Data analysis uses the Miles and Huberman model: data condensation, presentation, and verification. The validity of the data is used in triangulation techniques and data sources.

### **3. Results and Discussion**

In every research, of course, there is a presentation of data from the research results conducted by researchers. This study focuses on developing cognitive abilities in recognizing numbers with pictorial number card media in group A students at PAUD Permata Jember researchers in presenting research data using three kinds of data collection: observations, interviews, and documentation. Therefore, researchers will describe the findings obtained from field results as follows:

#### **1. Teachers plan to develop cognitive abilities in recognizing numbers with pictorial number card media in group A students at PAUD Permata Jember.**

In this initial stage, the teacher determines the theme that will be conveyed to the child; then, the teacher makes RPPH so that learning objectives can be achieved optimally.

Based on this explanation, it can be seen that before the teacher makes a lesson plan (RPPH), this is because the making of RPPH is guided by Permendikbud 137 and 146, after planning first or making RPPH according to the new theme after adjusting according to the theme and there learning uses pictorial number card media, and where the picture has numbers, letters, number symbols. There is a picture behind it that makes children more interested in playing it.

That is following the results of an interview with the principal of PAUD Permata Jember as follows :

"In my opinion, this initial activity is significant; a professional teacher educator in learning activities should follow the predetermined syllabus to improve early childhood development aspects."

Based on observations made at PAUD Permata Jember, the teacher first determines the theme and makes RPPH to achieve learning objectives at this stage.

It is in line with the results of the researcher's interview with Mrs. Ashlihatas, a group A teacher:

"Before carrying out learning activities, the principal and I negotiate and adjust the syllabus to make lesson plans and determine themes according to learning activities, then prepare teaching materials and media. Here, we have an idea for the media. We use illustrated number cards because the cards are unique and varied with pictures".

In the theme learning process in the material, there are number recognition activities with illustrated number card media. According to the teacher's instructions, students are taught to recognize numbers with illustrated number card media. Early Childhood School of Permata Jember has implemented this learning, which can develop children's ability to recognize numbers. The institution continues to innovate every lesson, and the teacher must be active to provide learning.

Next, prepare the media, namely the illustrated number card media, and choose the methods and teaching materials that will be implemented, one of which is the question and answer method and demonstration. Moreover, for teaching materials, one of them is using theme books about number recognition.

Endah Yulistiani's research with the title "Introduction to Numbers in Early Childhood at RA Diponegoro 154 Kab. Banyumas" also shows that in the introduction of numbers through various initial stages of children forming a number, the second stage of number games, the third stage through games to make numbers with plasticine, the fourth stage through storytelling with number media and the fifth stage through singing numbers. With the development stages carried out, it is proven that children can develop their abilities in number recognition.

Even what happens at PAUD Pemata Jember, the planning carried out in this school is based on the goals and expectations of the school for students, so the school's goal of providing a model for developing the ability to recognize numbers in students with illustrated number card media is achieved and runs optimally by the development of children's achievement. It can graduate students with sound development, and the community can also find out that this school can graduate students with good development and maturity to continue to the next level.

An activity requires planning, which is the first step that must be taken before carrying out an activity. With activities, it will be focused and directed under the goals to be achieved in the future.

Based on the results of interviews conducted by researchers to strengthen the validity of the data that the teacher's planning in developing cognitive abilities in recognizing numbers with pictorial number card media in group A students at PAUD Permata Jember includes several things, including before the teacher starts learning, the teacher first prepares teaching materials and materials that will be taught to students.

The first thing to do in making a lesson plan to develop the ability to recognize numbers in students is to hold a work program (poker) by making a semester program, which is a learning plan containing themes, development areas, developmental achievement levels, and indicators that are arranged sequentially and systematically. As is done in PAUD Permata Jember, the school formulates the learning process at the beginning of the semester program according to the level of child development.

According to *Gordon* and *Browne*, planning in writing has many advantages. In this case, it helps educators carry out teaching activities that focus on activities that are under children's nature, interests, needs, abilities, and potential.

Like the previous research from *Reni Yulistiana* titled "Efforts to Develop the Ability to Recognize Numbers 1-10 in Children at Kesuma Kindergarten Tanjung Karang Barat Bandar Lampung". The results of this study state that the efforts made by teachers in recognizing numbers stimulate children's cognitive development in terms of recognizing numbers 1-10 in early childhood. Using media for number recognition, namely number card media, number trees, rocks, and beads. With the right stimulus and by the development of children's age, get the expected results. The same applies to teaching activities using media in group A at PAUD Permata Jember.

The findings of the planning of teachers in developing cognitive abilities in recognizing numbers with pictorial number card media in group A students at PAUD Permata Jember goes well because in making plans to develop cognitive abilities in recognizing numbers, students must establish several things in writing, from planning or providing media or teaching materials to be delivered, even the assessment to be used, and the schedule of material on the theme that has been determined by group A at PAUD Permata Jember, and also by looking at the ability and development of children.

## **2. The form of teacher implementation in developing cognitive abilities in recognizing numbers with pictorial number card media in group A students at PAUD Permata Jember.**

Based on the results of observations, the next step is the implementation stage. The first (opening) is greeting, praying before

learning, and asking how the students are. The second is the core activity, namely seating management. Children are divided into groups to facilitate the implementation of pictorial number card learning activities; after that, they sing a song about number recognition and then prepare the media or teaching materials, namely illustrated number card media and teaching materials in the form of theme books about number recognition.

"To implement number recognition here, I manage the seating first and divide it into several groups to make it easier for me as a teacher to deliver pictorial number card learning activities consisting of 10 number cards and their images. Furthermore, we are here using a way of asking children to compete to find a picture number card that is randomized first. Then, the child is asked to count the number of pictures on the back. Furthermore, some of these groups will later be tasked with carrying out their findings about the numbers and pictures on the back". Said Mrs. Ashlihatus, group A teacher.

From the research results, as seen in the picture, the teacher is grouping children to come forward to form a circle to sing a song about number recognition.

Mrs. Ashlihatus sang the following song with group A students:

"Names of Numbers" One, two, three, and four. Five, six, seven, eight, Nine, and ten are the names of numbers Those are the names of numbers.

Next, the teacher allows the children to play picture number cards. Each child is given one picture number and then shows the number held by them to the teacher and their peers.

According to the homeroom teacher of class A, Mrs. Ashlihatus, she stated:

"In learning so that we know whether the child can or not, I first invite the child to sing in learning number recognition by using picture number card media so that the child can more easily understand the number and can also count using the picture, after that, I share the card media, then I show the picture so that the child does not get bored, after that tell stories about numbers and invite children to count the pictures, and we appoint children to take turns going forward, to count the pictures and write them on the board."

Teacher implementation in developing cognitive abilities in recognizing student numbers can be done with several methods. The method is used by educators in the success of a child's learning activities. Where PAUD Permata Jember uses the method of demonstration, assignment, and question and answer.

It is under the results of interviews with group A teachers as follows:



"I use the demonstration, assignment, and question-and-answer methods. In the demonstration method, I usually invite the children to take turns coming forward to imitate the numbers on the illustrated number cards. For the assignment method, I usually give the children the task of writing numbers in their notebooks. For the question and answer method, I usually ask the children when they are about to go home, for example, "What number did the teacher show?" For those who can answer, I let them go home

."

At the end of learning, the teacher repeats the learning activity material, which can be called recalling, by inviting children to show and mention all the pictures they hold. The results of interviews conducted by researchers show that teachers carry out material repetition or recalling activities to develop children's attention span.

Based on the findings in the field, it states that there are several forms of teacher implementation in developing cognitive abilities in recognizing numbers taught to students in each learning theme. The implementation of teachers in developing cognitive abilities in recognizing numbers with pictorial number card media there is three, among others, as follows:

- Opening  
Before learning begins, the teacher opens or begins the activity with greetings followed by praying before learning and preparing picture number cards.
- Core  
Then, at the core of learning is managing seating and dividing children into several groups while singing songs about numbers. Then, distribute illustrated number cards and invite children to come forward individually, and children demonstrate on the board in turn.
- Cover  
Closing activities, which students carry out, are silent in their seats, and the teacher reviews what activities are taught to students; for closing activities here, the teacher reflects on the activities of students after singing/playing guess the numbers and praying, then the teacher conducts a guessing demonstration interaction so that children are more enthusiastic and build an atmosphere in the classroom.

Based on the above statement, a teacher must also always see the development of children and see the interest in individual students; based on the theory of child development, it is believed that every child is born with more than one talent that is potential and like it has not appeared on the surface of the water. For this reason, children are given education

according to their development and cannot be forced but must always be given a stimulus to develop well like other students.

The above explanation on the implementation of teachers in developing cognitive abilities in students to recognize numbers with pictorial number card media applies to several things, namely opening or initial activities, core activities, and closing activities at PAUD Permata Jember.

Thus, the explanation of the discussion of the findings of the observations that researchers do. From this explanation, all the development of cognitive abilities in introducing numbers to students has been integrated through the pictorial number card media found in PAUD Permata Jember so that it can develop children's ability to recognize numbers optimally.

### **3. Teacher evaluation in developing cognitive abilities in recognizing numbers with pictorial number card media in group A students at PAUD Permata Jember.**

From the results of researcher observations, teacher evaluation in developing cognitive abilities in introducing numbers to group A students at PAUD Permata Jember shows that for every activity, the teacher constantly evaluates the activities that have been carried out. Teachers assess according to the stage of child development in learning.

The following is one of the researcher's interviews with the group A teacher:

"How about evaluating children's development in recognizing numbers during learning activities? Has it started to develop?" Said the researcher.

Then, group A's teacher answered:

"I am here evaluating according to the development of children; some have begun to recognize numbers as well as writing on the board, some have also developed although not fully, and some are still having difficulty because there are some children who rarely go to school because of the parents."

Based on the results of interviews conducted with the principal at PAUD Permata Jember, each child has different cognitive abilities, so the level of success is also different. The teacher knows the child's ability to recognize numbers using pictorial number card media. The child is shown a picture, counts the picture aloud, and writes the number on the board. The teacher asks the children whether it is correct or not as an example (is it true that Mas Ariya wrote children?) Some children justify, and some blame. In this way, the teacher knows whether or not children can understand numbers.

It is in line with the results of an interview with the principal at PAUD Permata Jember said:

"Teachers should not emphasize the results of children's activities, but teachers must first understand the child's abilities and continue to guide and always provide motivation to children so that children's cognitive abilities can develop optimally according to the child's ability."

Based on the observation above, PAUD Permata Jember provides opportunities for students to be more involved, and teachers can easily control the extent of the development of abilities that students have acquired.

Based on data analysis, this section describes the teacher's evaluation in developing cognitive abilities in recognizing numbers with picture number card media in group A students at PAUD Permata Jember.

It is crucial to assess the success of a program as the results can provide helpful information for educators, families, and communities. In addition, sometimes evaluation can place a school in a specific position compared to other schools.

In the evaluation conducted at PAUD Permata Jember, three things are done: observation (observation), work performance, and checklist. The assessment here is in the form of observation (observation), where the teacher observes each child's development, starting from not developing, developing very well, and developing as expected. There is an assessment of work performance (assignment) where students are given tasks such as writing numbers on the board according to the guidance of the teacher, and the last is a checklist, where the teacher sees the child's development starting from cognitive, physical, motoric, developing or not developing and is done every day.

The results of the evaluation of developing cognitive abilities in recognizing numbers with pictorial number card media in group A students at PAUD Permata Jember, as stated by the homeroom teacher, Mrs. Ashlihatu, see from the activities carried out by the child, because each child is different, the teacher has its strategy if there is one of the number participants who are unable to follow what the teacher instructs so that in the evaluation of the child is developing or not developing it can also be written in the learner assessment checklist, and that is one of the evidence or one of the information for educators.

*Krogh* and *Slentz* stated that to get to know children better. Assessment is critical and should be done by educators both formally and non-formally. For this reason, assessment should be carried out before the child does the activity, during, and after the activity or the product of the child's activity. According to the findings of interviews with Mrs. Ashlihatu

as a class teacher, this is the development of cognitive abilities in recognizing numbers with picture number card media in group A students at PAUD Permata Jember.

From the explanation above, it can be concluded that there are three kinds of assessments, namely observation (observation), performance (assignment), and checklist carried out by PAUD Permata Jember in developing cognitive abilities in recognizing numbers with pictorial number card media in group A students have been running correctly. From the above assessment, we know that children do not walk alone in the learning process; of course, there are teachers as knowledge providers at school, and there are parents who control at home.

#### **4. Conclusion**

Teacher planning in developing cognitive abilities in recognizing numbers with pictorial number card media in group A students at PAUD Permata Jember is the establishment of themes, preparing lesson plans, preparing learning media, choosing methods and teaching materials to be implemented, and providing information to students before learning activities.

The form of teacher implementation in developing cognitive abilities in recognizing numbers with pictorial number card media in group A students at PAUD Permata Jember is that three things are carried out. The first is the opening activity, namely greetings, prayers, and asking how the students are. Second is the core activity, namely seating management, singing songs about number recognition, distributing illustrated number card media to students, and implementing number recognition; students alternately demonstrate on the board. Then, the third is the closing activity, namely, the teacher instructs the recalling of today's learning activities, and the last is the closing activity of learning (praying).

Teacher evaluation in developing cognitive abilities in recognizing numbers with pictorial number card media in group A students at PAUD Permata Jember is observation, performance (assignment), and checklist.

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