Bulletin of Pedagogical Research

Vol. 4, No. 1, February 2024
https://attractivejournal.com/index.php/bpr/index

Improving Students' Cognitive Abilities through Jarimatics Method at Al-Hidayah Negarasaka Village Negerikaton District Pesawaran District

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Abstract

This research is based on the researcher's observations and experience, that cognitive abilities through Jarimatika are not just a medium for counting, but by using the Jarimatika method, children feel happy and there is no pressure. Using the Jarimatika method can train children's counting, and increase children's numeracy skills. Based on the background of the problem, the research problem was formulated, namely: whether the application of learning through the Jarimatika method is able to improve the numeracy skills of Group B RA students. Al-Hidayah, Negarasaka Village, Negerikaton District, Pesawaran Regency. This research uses a collaborative Classroom Action Research (CAR) approach. This research was carried out in two cycles, using instruments in the form of a calculation work sheet using the Jarimatika method and a teacher observation sheet. The improvement can be seen from the children's learning completeness in developing gross motor skills which has increased, this can be seen from the children's learning completeness in the Pras Cycle with a total of 40% completeness. then in cycle I it increased by 46.67%, and in cycle II the percentage of children's learning completion increased to 86.67%.

Keywords: Jarimatics Method, Improving Students' Cognitive, Numeracy Skills

Article History
Received : August 30, 2023
Revised : February 08, 2024
Accepted : February 11, 2024

INTRODUCTION

Kindergarten (TK) education is a form of early childhood education that is on the formal education route. As a school educational institution, the main task of kindergarten is to prepare children by introducing various knowledge, attitudes/behaviors, and skills so that children can continue real learning activities in elementary school. To be able to explore the potential of each child, efforts are needed that are appropriate to each child's condition. This effort can be done in various ways, including through preliminary counting. Numeracy in kindergarten is not only related to cognitive abilities[1,2,3], but also

[1] Scott Davies et al., "Using the Early Development Instrument to Examine Cognitive and Non-Cognitive School Readiness and Elementary Student Achievement," *Early Childhood Research Quarterly* 35 (April 1, 2016): 63–75, https://doi.org/10.1016/J.ECRESQ.2015.10.002.

[2] Kristin R. Laurens et al., "Reading and Numeracy Attainment of Children Reported to Child Protection Services: A Population Record Linkage Study Controlling for Other Adversities," *Child Abuse & Neglect* 101 (March 1, 2020): 104326, https://doi.org/10.1016/J.CHIABU.2019.104326.

[3] Carlos Valiente et al., "School Readiness and Achievement in Early Elementary School: Moderation by Students' Temperament," *Journal of Applied Developmental Psychology* 74 (May 1, 2021): 101265, https://doi.org/10.1016/J.APPDEV.2021.101265.

Published by **CV. Creative Tugu Pena**
ISSN **2775-2305**
Website **https://attractivejournal.com/index.php/bpr/index**

social[4] and emotional mental readiness[5,6,7], therefore its implementation must be done in an interesting, varied and fun way. The counting method is part of mathematics, this is necessary to develop numeracy skills which are very necessary in everyday life[8,9,10] especially the concept of numbers which is also the basis for developing mathematical abilities and readiness to take part in further education[11,12]

In reality, learning to count is still difficult, especially at an early age. This is caused by several problematic factors, both from teachers, students and supporting learning resources. Therefore, to solve this problem, classroom action research is needed as an effort to improve the implementation of initial numeracy learning for RA children, this is characterized by the following conditions: the 20 children, only 3 children or 29.17% understood number symbols, while 17 children or 70.83% did not understand number symbols. Only 5 children or 20.83% understood and were able while 15 children or 41.7% understand the simple process of counting plus or minus. They do not understand how to carry out simple calculation processes.

The lack of development of initial numeracy skills for children in group a ra.al-hidayah, Negarasaka Village, Negerikaton District, Pesawaran Regency, can occur due to the following factors: The process of teaching and learning activities in class has not run optimally, Lack of methods for learning to start counting that are easy and interesting for children, There are still limited teaching aids for beginning counting, and some children do not understand the simple process of counting plus or minus. Hence, the aim of this study obtaining data on cognitive abilities in Group A Ra.Al-Hidayah children, Negarasaka Village, Negerikaton District, Pesawaran Regency after taking action. To determine the increase in cognitive abilities in children in group A Ra.Al-Hidayah, Negarasaka Village, Negerikaton District, Pesawaran Regency before and after taking action. The last is collecting data on cognitive abilities in group a Ra.Al-Hidayah children, Negarasaka Village, Negerikaton District, Pesawaran Regency after taking action.

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[7] Megan F. Bell et al., "Numeracy and Literacy Attainment of Children Exposed to Maternal Incarceration and Other Adversities: A Linked Data Study," *Journal of School Psychology* 100 (October 1, 2023): 101241, https://doi.org/10.1016/J.JSP.2023.101241.

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Literature Review

1. Cognitive Ability

Some experts in the field of education define intellectual or cognitive as follows: According to Piaget Cognitive is a mental activity in knowing[13] and knowing about the outside world[14]. Other scholars stated that cognitive has a broad understanding of how to think[15] and observe[16]. So, Cognitive is the behavior that results in a person acquiring knowledge or that is needed to acquire and use the knowledge he has acquired.

Cognition is the foundation for children's early work with numbers. According to Hanna M. Gavelin et al., states that cognitive refers to mental activities regarding how information enters the mind[17], is stored, and transformed as well as being recalled and used in complex activities such as thinking. Cognitive is a thinking process, an individual's ability to connect, assess and consider an incident or incident. In general, cognitive is defined as intellectual potential which consists of stages: knowledge[18], understanding or comprehention[19], application[20], analysis[21], synthesis[22], sand evaluation[23]. It's means issues involving the ability to develop reasoning abilities. Cognitive theory emphasizes the process or effort to optimize the rational aspect abilities possessed by other people. Cognitive is a broad understanding of thinking and knowing the knowledge needed to use knowledge. Meanwhile others scholar informed that cognitive is a natural process of thinking, namely the ability of each individual to

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[13] Yury S. Dodonov and Yulia A. Dodonova, "Basic Processes of Cognitive Development: Missing Component in Piaget's Theory," *Procedia - Social and Behavioral Sciences* 30 (January 1, 2011): 1345–49, https://doi.org/10.1016/J.SBSPRO.2011.10.260.

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[22] Ebru Altun and Nagihan Yildirim, "What Does Critical Thinking Mean? Examination of Pre-Service Teachers' Cognitive Structures and Definitions for Critical Thinking," *Thinking Skills and Creativity* 49 (September 1, 2023): 101367, https://doi.org/10.1016/J.TSC.2023.101367.

[23] Yan Zhang et al., "Intuition or Rationality: Impact of Critical Thinking Dispositions on the Cognitive Processing of Creative Information," *Thinking Skills and Creativity* 48 (June 1, 2023): 101278, https://doi.org/10.1016/J.TSC.2023.101278.

connect, assess and consider an event or event[24]. From the opinions of several figures above, it can be concluded that cognitive is an activity that is really needed by humans in seeking knowledge to help humans overcome their problems, both in the social, economic and socio-cultural fields.

2. **Early Childhood Cognitive Stages.**

A child's motoric and physical development is closely related to the child's psychological growth. Therefore, early childhood development psychology is related to the overall growth and development of children[25]. Children will experience a period called the golden age of children at an early age, at which time the child will be very sensitive and sensitive to various external stimuli and influences[26]. The rate of development and growth of children affects each child's golden age. During the golden age, children will experience a very drastic level of development starting from thinking development, emotional development, motoric development, physical development and social development. This surge in development occurs when children are aged 0-8 years, and the surge in child development, especially during early development, parents really need to pay special attention to, because this will definitely have a big influence on the child's life in the future.

3. **Factors that Influence the Development of Cognitive Abilities**

The children will build their own cognitive world. In developing numeracy skills there are several influencing factors including:

a. Heredity Factor

The theory of heredity or nativism was first pioneered by philosophers*Scopen hauer.* He believes that humans are born with potential that cannot be influenced by the environment. Based on his theory, the level of intelligence has been determined since the child was born, since environmental factors have no significant influence on it.

b. Environmental factor

Environmental theory or empiricism was pioneered by Loeke. He argued that humans are born actually holy or tabula rasa. In his opinion, human development is greatly influenced by the environment. Based on Locke's opinion, the development of the level of intelligence is determined by the experience and knowledge gained from the child's living environment, background and experiences at home.

c. Maturity Factor

Each organ (physical and psychological) can be said to be mature if it has achieved the ability to carry out its respective functions. Maturity is closely related to chronological age (calendar age).

d. Formation Factors

Formation is all circumstances outside a person that influence the development of intelligence. Formation can be divided into intentional formation (school/formal) and unintentional formation (influence of the natural environment/informal).

e. Interests and Talents

Interest directs action towards a goal and is an encouragement to that action. What interests a person encourages him to do more actively and better. Meanwhile,

[24] Katerina Tsarava et al., "A Cognitive Definition of Computational Thinking in Primary Education," *Computers & Education* 179 (April 1, 2022): 104425, https://doi.org/10.1016/J.COMPEDU.2021.104425.

[25] Shu Cai and Wei Li, "On the Origin of Cognition: How Childhood Conditions Shape Cognitive Function in Old Age," *China Economic Review* 83 (February 1, 2024): 102079, https://doi.org/10.1016/J.CHIECO.2023.102079.

[26] Hanamori F. Skoblow, Christine M. Proulx, and Francisco Palermo, "Childhood Socioeconomic Position and Later-Life Cognitive Functioning in the U.S.: A Critical Review," *Developmental Review* 71 (March 1, 2024): 101104, https://doi.org/10.1016/J.DR.2023.101104.

talent can be interpreted as potential that still needs to be developed and trained in order to realize the talent.

f. Freedom

Freedom is the freedom of humans to think divergently, which means that humans can choose certain methods in solving problems, and are also free to choose problems according to their needs.

4. Methods for Developing Cognitive Abilities in Counting

Conveying/transferring appropriate knowledge to preschool age children so as to produce maximum understanding for students. The following are various methods that can be used to develop cognitive abilities in counting:

a**.** Play

According to educators and psychologists, playing is childhood work and a reflection of children's growth. playing is a non-serious activity and everything is in the activity itself which can give satisfaction to the child.

b. Assignment Method

The method of giving assignments is certain work that must be done deliberately by children who receive assignments in kindergarten. Children are given assignments in the form of opportunities to carry out them according to the teacher's instructions.

c. Demonstration Method

The demonstration method is a way of demonstrating or the process of an incident or event. Teachers are required to demonstrate something clearly, props must be prepared in advance, so that when demonstrating something they are not hampered or distracted.

d. Question and Answer/conversation method

The Question and Answer method is a method of asking questions and answers, the teacher gives open questions, so that the child can answer several possibilities, based on the child's experience, the teacher must try to give answers, not a teacher who actively provides information.

5. Understanding the Jarimatics Method

a. Definition of Jarimatics

Method comes from Greek*"Methods"*which means the way or path taken. The method function means a tool to achieve goals. A teacher must know knowledge about teaching methods, because whether students learn successfully or not depends on whether or not the teaching methods used by the teacher are appropriate. Methods must also be adapted to the subject matter and student characteristics. In multiplication material, one method that can be used is the Jarimatika method. Jarimatika is an abbreviation of the words finger and arithmetic which means how to calculate the operations of add, subtract, divide and multiply using the fingers of the hand. Mathematics can show children that mathematics, especially counting, is fun. Jarimatika is a mathematics learning method that utilizes the ten fingers that humans have. Jarimatika is a medium that can be used in learning, where the medium used is the fingers which cannot possibly be confiscated during the exam.

According to M.K. Abdullah "Jarimatics is a way of counting using the function of the fingers as a tool to carry out arithmetic operations, Times–Divide–Add–Subtract (KaBaTaKu)". Based on the definition above, it can be concluded that the finger method is a method or method used to calculate the operations of addition, subtraction, multiplication and division using the fingers of the hand.

b. Use of the Jarimatics Method

There are many ways that can be used in multiplication material in mathematics subjects. One way is to use the Jarimatika method. This method will make learning multiplication easier. According to Septi Peni Wulandani Jarimatika is

a simple and fun way of teaching basic counting to children according to rules, including:

a. Starting with a correct understanding of the concept of numbers, number symbols, and basic arithmetic operations.
b. Then teach them how to count with their fingers.
c. The process begins, is carried out and ends happily.

The general implementation of learning to count using Jarimatika is as follows:

a. The teacher demonstrates how to count using math.
b. Students listen and demonstrate what the teacher demonstrates.
c. The teacher accompanies students in group study and goes around monitoring the learning process.
d. Students present their learning results in front of the class.
e. The teacher provides explanations to students who do not understand

Multiplication is repeated addition of the same number. There are many methods that can be used in multiplication material in mathematics subjects. One of them is the Jarimatika method, with this method calculating multiplication will be easier. In calculating multiplication using finger math, the numbers in this multiplication operation are divided into several parts, namely: group A numbers 6 to 10, group B numbers 11 to 20, group C numbers 21 to 30. This group of multiplication numbers in finger math comes to group F numbers 40 to 50, the pronunciation of the numbers on each finger is not always the same, but is adjusted to the groups. Examples of Jarimatic formations according to Nurhayati Rahayu are as follows:

1. Group A: multiplication of numbers 6 to 10
   a. Right hand
   1) One finger standing for the number 6
   2) Two fingers that stand for the number 7
   3) Three fingers stand for the number 8
   4) Four fingers that stand for the number 9
   5) Five fingers stand for the number 10
   b. Left hand
   1) One finger standing for the number 6
   2) Two fingers that stand for the number 7
   3) Three fingers stand for the number 8
   4) Four fingers that stand for the number 9
   5) Five fingers stand for the number 10

   Formula :

   $(B_1+B_2) + (T_1 \times T_2)$

   Information:
   B1 = opened right hand fingers (tens)
   B2 = open left hand fingers (tens)
   $T1$ = closed right hand fingers (unit)
   $T1$ = closed left hand fingers (unit)

Example 1

What is the result of 7 x 10 =

Figure 1. Multiplication 7 x 10

Jadi 7 x 10 = (B1+B2) + (T1 x T2)
= (20 + 50) + (3 x 0)
= 70 + 0

= 70

2. Group B: Multiplication of numbers 11 to 15

a. Right hand

1) One finger standing for the number 11
2) Two fingers that stand for the number 12
3) Three fingers stand for the number 13
4) Four fingers that stand for the number 14
5) Five fingers stand for the number 15

b. Left hand

1) One finger that stands for the number 11
2) Two fingers that stand for the number 12
3) Three fingers that stand for the number 13
4) Four fingers that stand for the number 14
5) Five fingers stand for the number 15

In contrast to multiplying numbers 6 to 10, only the open fingers are used to count.

Formula :

$$100+ (B_1+B_2) + (S_1xS_2)$$

Information :

B1 = Opened right hand fingers (tens)

B2 = Opened left hand fingers (tens)

S1&*S2* = Unit value in the question

Example 2

What is the result of 11 x 12

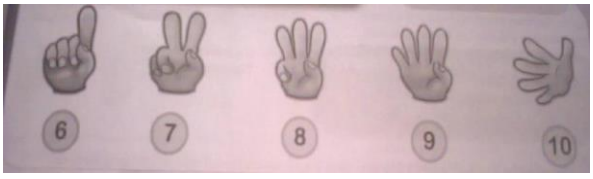

Figure 2. Multiplication 11 x 12

So 11 x 12 $= 100+ (B_1+B_2) + (S_1xS_2)$

$= 100+ (10+ 20) + (1 x 2)$

$= 130 +30 + 2$

$= 132$

3. Multiplication of different groups, namely group A and group B

In different multiplication groups, only use open hands, only the concept is slightly different from before. The formula used for group B is:

Group A members = 6,7,8,9,10

Group B members = 11,12,13,14,15

Formula :

$$(10 \times B_1) + (B_1 x\ B_2)$$

Information :

B_1 = standing finger on the right hand (actual value)

B_2= unit value of standing finger on left hand (actual value- 10)

Example 3

What is the result of 7 x 15 =

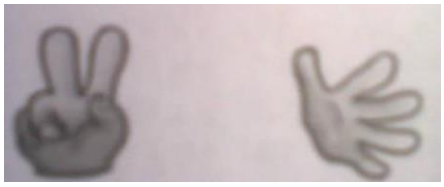

Figure 3. Multiplication 7 x 15

So 7 x 15 = (10 x B_1) + (B_1 x B_2)
= (10 x 7) + (7 x 5)
= 70 + 35

Learning to count using the finger method allows children to be creative in expressing their ideas according to their level and indicators. Learning to count using the finger method gives children a lot of stimulation, apart from making them happy, it can also increase the knowledge of young children. It is hoped that it will be able to provide benefits from learning to count using the Jarimatika method in children's lives, so the use of learning activities using the Jarimatika method in implementing early childhood education programs is an absolute requirement that cannot be ignored. For young children, learning is playing while learning, one form of learning that is popular with children is learning to count using the finger method. In this lesson there is an element of learning, because in the shape of the fingers there are several shapes and characters that children like. Therefore, children will easily understand material related to developing children's numeracy skills. giving children enthusiasm and imagination in learning, can improve the quality of learning and improve numeracy skills in Group A RA.AL-HIDAYAH children, Negarasaka Village, Negerikaton District, Pesawaran Regency.

It is hoped that the results of this research can develop learning about children's numeracy skills regarding cognitive understanding so that they can achieve the expected results. The initial condition is that the teacher has not used the Jarimatika method in initial numeracy learning, so the child's numeracy ability is low. To improve cognitive abilities, it is necessary to take action by researchers, namely by learning through the use of the Jarimatika method. Cycle I uses the Jarimatika method in groups (1 group of 3-4 children), cycle II uses Jarimatika in groups (1 group of 2-3 children) in small groups (1 group of 2 children). With different actions from cycle I to cycle II, it is hoped that cognitive abilities will increase. The final condition is thought to be that the Jarimatika method can improve cognitive abilities in addition and subtraction in children A RA.AL-HIDAYAH, Negarasaka Village, Negerikaton District, Pesawaran Regency, Academic Year 2022/2023

METHODS

Research Subjects and Settings

The subjects in this research were children from Group A RA.AL-HIDAYAH, Negarasaka Village, Negerikaton District, Pesawaran Regency. Semester II 2022/2023 academic year. In one class there are 24 children. This activity was carried out in group A class. The reason group A was chosen as the research subject was because the researcher was the caretaker of this group and the researcher attempted to coordinate the addition and subtraction abilities of his students, which were large, leading to counting activities using the Jarimatika method. This research was carried out in the 2022/2023 academic year, namely November 1, 2022 to December 1, 2022. The timing of the research refers to the school academic calendar, because it requires several cycles that require an effective learning process. This activity was carried out in group A class with a total of 24 children.

Research procedure

This research uses the form of classroom action research (PTK). Classroom action research is research carried out by teachers in their own classes through self-reflection with the aim of improving their performance so that student learning outcomes increase[27]. sClassroom action research in English is known by the term*Classroom Action Recearch* (CAR). Forming understanding, namely:

[27] Nipaporn Kunlasomboon, Suwimon Wongwanich, and Siripaarn Suwanmonkha, "Research and Development of Classroom Action Research Process to Enhance School Learning," *Procedia - Social and Behavioral Sciences* 171 (January 16, 2015): 1315–24, https://doi.org/10.1016/J.SBSPRO.2015.01.248.

1. Research is the activity of looking closely at objects, using certain methodological rules to obtain data or information that is useful for improving the quality of something that is of interest and important to researchers.
2. Action is an activity that is deliberately carried out with a specific purpose, which in this research takes the form of a series of activity cycles.
3. A class is a group of students who at the same time receive the same lesson from a teacher. The boundaries written for the definition of class are the old meaning to disable wrong understanding and is widely understood by the public as "the room where the teacher teaches" because the class is not a room but a group of students who are learning.

So it can be concluded that classroom action research is an examination of learning activities in the form of actions, which are deliberately created and occur in a class simultaneously. This research was designed in 3 cycles which were preceded by pre-action. The classroom action research model used was a model*Kemmis & Taggart (in Arikunto,*2002) which is in a spiral shape from cycle to next cycle. Each cycle includes (1) Planning (2) Action (3) Observation (4) Reflection. The next step is revised planning, action, observation and reflection. Before entering cycle I Preliminary action is taken in the form of problem identification. The spiral cycle of the stages of classroom action research is described as follows:

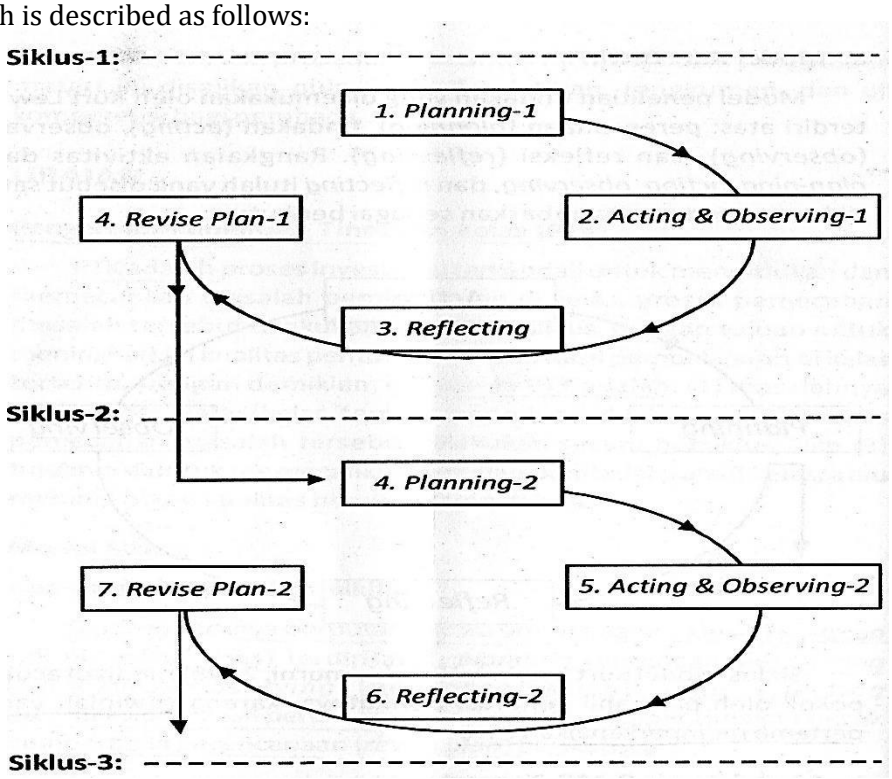

Chart 1 Kemmis and Taggart Model (in Arikunto, 2002)

From the picture above it can be explained that 1 cycle (one round) includes four steps, namely: planning, action, observation and reflection.

1. **Planning (*Planing*)**

   In determining planning, it can be divided into two, namely general planning and special planning. General planning is intended to prepare plans using mathematics which is expected to improve cognitive abilities.

   Meanwhile, special planning was carried out faithfully for re-planning. This planning includes preparing yourself through the activities of preparing the facilities and props that will be used.
2. **Acting**

In principle, action is the realization or implementation of what has been previously planned. Things to pay attention to are:

a. Is there a match between implementation and planning?
b. What is the action process carried out by the object that performs the action?
c. What is the situation of the action process?
d. Is the object performing the action capable of carrying out the action with enthusiasm?
e. What is the result of all the actions?

Related to this research, before learning begins the teacher provides an explanation of the equipment used and how to use it

3. Observation (*Observing*)

Observations or observations can be made by researchers or collaborators who are assigned this task. The things observed are the action process in research activities, for example: the situation of learning activities, teacher performance, presentation of learning activities through play methods and students' responses to the games presented.

4. Reflection (*Reflection*)

Reflection is reflecting on the results of research regarding everything carried out by collaborators or participants related to classroom action research. Collaborators are asked to recall or report what happened during the implementation of the action. Express opinions and suggestions for improving the action*(Replanning).*

The action studied was the implementation of series image media to develop storytelling abilities. This classroom action research (PTK) was planned in 2 cycles. The steps taken by researchers in each cycle are as follows:

1. Cycle 1

a. Initial reflection/planning stage.

At this stage the researcher identified problems and analyzed problems based on initial studies (pre-cycle) in improving the numeracy skills of group A RA.AL-HIDAYAH group children, Negarasaka Village, Negerikaton District, Pesawaran Regency for the 2022/2023 academic year.

The action plan taken is to make teaching preparations with the following steps:

1. Arrange learning in accordance with basic competencies
2. Determine activity materials that are tailored to the goals to be achieved.
3. Determine the learning methods that will be used in research.
4. Formulate teaching and learning activities.

b. Level of Action Implementation.

At this stage the teacher carries out learning activities according to what has been planned. The teacher carries out learning activities using predetermined learning methods.

c. Observation / Observation.

Observations in this classroom action research were carried out by observing the learning process which included children's activities in learning activities and document analysis. The teacher, assisted by collaborators, observes the ongoing learning process.

Record the data that appears then transcribe it. Document analysis of the results of children's activities both in groups and individually. Data about children's numeracy skills is measured by comparing the results of children's numeracy skills at the beginning of the pre-cycle with the results after the action is taken. Apart from measuring the increase in children's numeracy skills, it is also measured by increasing children's learning motivation by observing children's activities during the learning process.

d. Reflection

After the observation is complete, the researcher and class teacher/collaborator discuss the numeracy skills that the child has achieved. When carrying out counting

activities, children are very enthusiastic and able to carry out the activities provided. From the reflection that has been carried out, it can be concluded whether the child's numeracy skills are optimal or whether learning still needs improvement. If these abilities are less than optimal, then the researcher steps in and creates a learning plan for the next cycle.

2. Cycle II

The action plan carried out in cycle II is basically the same as cycle I. The learning stages carried out include:

a. Initial Reflection / Planning stage

Based on cycle I reflection, the researcher will carry out re-planning. The results of this re-planning will be applied in cycle II. Before implementing cycle II, the researcher first made notes on the problems that arose in cycle I and applied them to cycle II, in outline a plan of action that would be carried out in preparation for teaching with the following steps:

1. Arrange learning in accordance with basic competencies
2. Determine activity materials that are tailored to the goals to be achieved.
3. Determine the learning methods that will be used in research.
4. Formulate teaching and learning activities.

b. Action implementation level

At this stage, the teacher carries out learning activities according to what has been planned. The teacher carries out activities using the same media, namely counting using the finger method.

c. Observation/observation stage

When researchers practice learning through play, at this stage observations are made of the learning process and note down the symptoms that appear in the learning. The focus of observation is the children's counting using the provided finger method and obeying the agreed game rules. And the assessment used is performance assessment.

d. Level of Reflection

After the observation data has been analyzed, the teacher carries out self-reflection on the learning activities that have been carried out. The results of the reflection are recorded or carried out in a separate activity with collaborators. The results of the reflection in this cycle's activities are used to determine the next cycle's actions, whether it is necessary to carry out cycle III or just stop at cycle II.

1.1 Instrumentation And Data Collection Techniques

1. Type of Data Required

a. Data on the numeracy skills of children in Group A RA.AL-HIDAYAH, Negarasaka Village, Negerikaton District, Pesawaran Regency, 2022/2023 academic year.
b. Data regarding the implementation of learning during the action phase of PTK carried out in November 2022/2023 academic year

2. Data collection techniques and instruments

Data on the numeracy skills of children in Group A RA.AL-HIDAYAH, Negarasaka Village, Negerikaton District, Pesawaran Regency, 2022/2023 Academic Year.

Data Collection Instrument (Child Development Tool)

1. Subjects assessed: Group A children
2. Ability assessed: Numeracy ability
3. Indicator: Counting numbers (kog 30)
4. Assessment technique: Performance
5. Procedure: 1. Children pay close attention when the teacher delivers the material. 2. Children can understand counting techniques using the Jarimatika method. 3. Children can play the Jarimatika method well.

3. Assessment criteria

a. Children get four stars if they are able to count well.

b. Children get three stars if they are able to count without the help of a teacher.
c. Children get two stars if they are able to count with the help of the teacher.
d. Children get one star if they are not able to count well.

4. Data about learning implementation

Data collection techniques regarding numeracy skills in Group A RA.AL-HIDAYAH children, Negarasaka Village, Negerikaton District, Pesawaran Regency, Academic Year 2022 / 2023 and data regarding the implementation of learning during action from PTK are as follows:

5. Work method

Wahyudin (2011) in the book assessing early childhood development explains that child performance is an assessment that requires students to carry out tasks in actions that can be observed, for example practicing singing, demonstrating something. The instrument used in this performance technique uses performance sheet guidelines in the form of a checklist for children's numeracy skills.

RESULT AND DISUCSSION

In compiling the results of research data analysis as well as accountability or proof of the implementation of educational activities in Group A RA.AL-HIDAYAH, Negarasaka Village, Negerikaton District, Pesawaran Regency, in general the results and analysis of this research include:

Overview of the Research Setting

The research was carried out in Group A RA.AL-HIDAYAH, Negarasaka Village, Negerikaton District, Pesawaran Regency in the first semester of November 2022/2023 on Group A students for the 2022/2023 academic year by developing cognitive aspects through the Jarimatika method. This institution was chosen because in Group A RA.AL-HIDAYAH, Negarasaka Village, Negerikaton District, Pesawaran Regency, it is the place where researchers work. Apart from that, it was still found that there was a lack of children's cognitive abilities, especially counting using the finger method. Therefore, researchers want to improve the cognitive abilities of children in Group A RA.AL-HIDAYAH, Negarasaka Village, Negerikaton District, Pesawaran Regency. The things that were observed were the ability to count, a general description of the research of students through counting using the Jarimatika method.

Description of Cycle Research Findings

The classroom action research design model used by researchers refers to the design of Kemmis and Taggart (2002) which was implemented through three cycles. The description of each action cycle is as follows:

1. Implementation of Cycle 1

The implementation of cycle I actions was carried out in one meeting on November 7 2022. At this planning stage the researcher prepared the learning that would be used for effective learning. A daily activity plan was made. The criteria for a child's success in developing cognitive abilities through counting using the Jarimatika method are determined if the child's learning completeness in counting reaches 75%.

a. Level of Action Implementation

The first cycle was carried out according to plan, namely one meeting on November 7 2022. At this meeting the number of children attending was 20. In this cycle the learning process takes place according to the daily activity plan that has been determined. The learning activity process begins by providing an explanation of counting techniques using the finger method, then the researcher asks the children to do it, the teacher guides them throughout the activity process.

b. Observation Stage

Observations are carried out simultaneously with the implementation of learning actions where the teacher acts as the presenter of the material. The teacher collects data

on every action carried out by the children and teacher during the activity from the start of the activity to the end of the activity. The data from observations of the process of learning activities and the results of children's performance are as follows:

Table 1

Performance Results of Numeracy Ability in Cycle I of Group A Ra.Al-Hidayah Children, Negarasaka Village, Negerikaton District, Pesawaran Regency

No	**No**	**Rating result**				Ministry of Health 75%	
		☆	☆☆	☆☆☆	☆☆☆☆	Complete	Not Completed
1	AND K	√					√
2	AHMAD M			√		√	√
3	AHMAD Z				√	√	
4	ANINDHIYA			√		√	√
5	AQILAH	√					√
6	ARSYLA				√	√	
7	EKI SAPUTRA		√				√
8	GRACELLA	√					√
9	KHUMAIRA			√		√	
10	FOR NOW	√					√
11	MUHAMMAD	√					√
12	MUFIA	√					√
13	SHAQUEENA	√					√
14	REVAN	√					√
15	THALITA			√		√	
16	FADHLI	√					√
17	AFZAR HAZIQ	√					√
18	INSHA		√			√	√
19	RAFASH	√					√
20	ZULAIKHA		√			√	√
Amount		**11**	**3**	**4**	**2**	**8**	**12**
Percentage		**55 %**	**15 %**	**20 %**	**10 %**	**40 %**	**60 %**

Based on this data, the success rate can be calculated in the following way:

1) The group of students has not yet developed ☆

$$P = \frac{f}{N}\ x\ 100\%$$

$\frac{11}{20}\ x\ 100\%$ = 55 %

2) The group of students begins to develop 2 ☆☆

$$P = \frac{f}{N}\ x\ 100\%$$

$\frac{3}{20}\ x\ 100\%$ = 15 %

3) The group of students develops according to expectat ☆☆☆

$$P = \frac{f}{N}\ x\ 100\%$$

$\frac{4}{20}$ x 100% = 20 %

4) The group of students is developing very well 4 ☆☆☆☆

$$P = \frac{f}{N} x\ 100\%$$

$\frac{2}{20}$ x 100% = 10 %

5) Percentage of children's learning completeness (Complete)

$$P = \frac{f}{N} x\ 100\%$$

$\frac{8}{20}$ x 100% = 40 %

6) Percentage of children's learning completion (Not Completed)

$$P = \frac{f}{N} x\ 100\%$$

$\frac{12}{20}$ x 100% = 60 %

In the way the teacher conveys how to explain the steps in learning to count so that children can understand it, the teacher's ability is still within the sufficient criteria, in this case because the time provided is still insufficient, because it is still in the introduction to learning. So the teacher's delivery or explanation doesn't seem optimal, so there are still many children who don't understand what the teacher is saying. Indicators of the teacher's ability to encourage children to be active in learning numeracy activities are still within the sufficient criteria. This is because children do not focus enough attention on counting activities. So, the teacher must condition by taking turns. This makes children impatient when waiting to learn to count and chooses to play on their own. So, some children still cannot join in learning to count.

Table 2
Teacher Observation Results in Activities to Improve Children's Cognition Through Counting Using the Jarimatika Method in Cycle I

No	Observation Items	Of	No
1	The teacher conveys apperception	√	
2	The teacher explains in learning about counting using the Jarimatics method	√	
3	The teacher actively provides examples	√	
4	The teacher actively held a question and answer session	√	
5	Teachers motivate children in learning activities	√	
6	The teacher guides in counting activities using the Jarimatika method	√	
7	Teachers give freedom to children in learning	√	

From table 4.2 above, it can be explained that the teacher has conveyed his perception and explained in the lesson regarding the problems of learning to count using the Jarimatika method. The teacher guides learning to count using the Jarimatika method and the teacher actively gives examples in learning to count using the Jarimatika method, but the teacher is not yet active in holding questions and answers with the children and does not motivate the children.

c. Reflection Stage

Based on the results of observations made, it shows that the teacher's delivery of objectives, giving children freedom in doing arithmetic, is good. However, there are still things that are lacking in the learning process activities, such as teachers who are less active in motivating children, teachers who are less active in guiding children, and

less active in holding questions and answers, less in motivating children, so this results in some children lacking understand what is ordered by the teacher, and are less able to carry out counting activities using the finger method.

The results from observing children in counting activities using the finger method to improve cognitive abilities can be seen based on the percentage of learning completeness in the first cycle below.

Table 3

Percentage of Children's Learning Completeness in Cycle I

No	Results of child development assessments	Amount	Percentage
1	Complete	Child	83,33 %
2	Not finished yet	Child	13 %
Amount		Child	100 %

Based on the table of results of the percentage of children's learning completeness above, it can be seen that the level of learning completeness still reaches 83.33%, so this learning activity can be said to be incomplete and needs to be improved in cycle II.

2. Implementation of Cycle II actions

a. Planning Stage

The implementation of cycle II actions was carried out on November 21 2022, at this planning stage the researcher prepared the learning media that would be used. For the effectiveness of learning, daily activity plans have been made.

The criteria for a child's success in activities to improve their cognitive ability by counting using the finger method are determined if the child's learning completeness in learning to count reaches 75%.

b. Implementation Level

The second cycle was carried out according to plan, namely one meeting on November 21 2022. At this meeting the number of children attending was 20. In this cycle the learning process takes place in accordance with the daily activity plan that has been determined. The learning activity process begins by providing an explanation of counting techniques using the Jarimatics method, then asking the children to carry out counting activities and the teacher guides them throughout the activity process.

c. Observation Stage

During the activity, the teacher carries out assessments in the process of learning activities, observes children's activities, and provides assessments of children's performance. Observations were made from the end of the learning activity. The data from observations of the process of learning activities and the results of children's performance in cycle II are as follows:

Table 3

Performance Results of Numeracy Ability in Cycle II of Group A RA.AL-HIDAYAH Children, Negarasaka Village, Negerikaton District, Pesawaran Regency

No	**No**	**Rating result**				Ministry of Health 75%	
		☆	☆☆	☆☆☆	☆☆☆☆	Complete	Not Completed
1	AND K			√		√	
2	AHMAD M				√	√	
3	AHMAD Z		√				√
4	ANINDHIYA			√		√	
5	AQILAH			√		√	
6	ARSYLA				√	√	
7	EKI SAPUTRA		√				√
8	GRACELLA				√	√	

9	KHUMAIRA			√		√	
10	FOR NOW				√	√	
11	MUHAMMAD				√	√	
12	MUFIA		√				√
13	SHAQUEENA			√		√	
14	REVAN				√	√	
15	THALITA				√	√	
16	FADHLI			√		√	
17	AFZAR HAZIQ				√	√	
18	INSHA				√	√	
19	RAFASH				√	√	
20	ZULAIKHA				√	√	
Amount		**0**	**3**	**6**	**11**	**17**	**3**
Present		**0%**	**15 %**	**30 %**	**55 %**	**85 %**	**15 %**

Based on this data, the success rate can be calculated in the following way:

1) The group of students is not yet developed

$$P = \frac{f}{N}\ x\ 100\%$$

2) The group of students begins to develop 2 ☆☆

$$P = \frac{f}{N}\ x\ 100\%$$

$\frac{3}{20}\ x\ 100\%$ = 15 %

3) The group of students develops according to expectat ☆☆☆

$$P = \frac{f}{N}\ x\ 100\%$$

$\frac{6}{20}\ x\ 100\%$ = 30 %

4) The group of students is developing very well 4 ☆☆☆☆

$$P = \frac{f}{N}\ x\ 100\%$$

$\frac{11}{20}\ x\ 100\%$ = 55 %

5) Percentage of children's learning completeness (Complete)

$$P = \frac{f}{N}\ x\ 100\%$$

$\frac{17}{20}\ x\ 100\%$ = 85 %

6) Percentage of children's learning completion (Not Completed)

$$P = \frac{f}{N}\ x\ 100\%$$

$\frac{3}{20}\ x\ 100\%$ = 15 %

In the way the teacher conveys how to explain the steps in learning to count so that children can understand it, the teacher's ability is still within the sufficient criteria, in this case because the time provided is still insufficient, because it is still in the introduction to learning. So the teacher's delivery or explanation doesn't seem optimal, so there are still many children who don't understand what the teacher is saying.

Indicators of the teacher's ability to encourage children to be active in learning numeracy activities are still within the sufficient criteria. This is because children do not focus enough attention on counting activities. So, the teacher must condition by taking

turns. This makes children impatient when waiting to learn to count and chooses to play on their own. So, some children still cannot join in learning to count.

Table 4.

Teacher Observation Results in Activities to Improve Children's Cognition Through Counting Using the Jarimatika Method in Cycle II

No	Observation Items	Of	No
1	The teacher conveys apperception	√	
2	The teacher explains in learning about counting using the Jarimatics method	√	
3	The teacher actively provides examples	√	
4	The teacher actively held a question and answer session	√	
5	Teachers motivate children in learning activities	√	
6	The teacher guides in counting activities using the Jarimatika method	√	
7	Teachers give freedom to children in learning	√	

From table 4.5 above, it can be explained that the teacher has conveyed his perception and explained in the lesson about learning to count using the Jarimatika method, and the teacher has been more active in guiding children in this learning. The teacher is enough to motivate the child, but the teacher is not yet active in holding questions and answers with the child regarding the child's understanding of the procedures for learning to count using the Jarimatika method.

d. Reflection Stage

Based on the results of observations made, it shows that the teacher's delivery of goals gives children freedom to carry out activities well. However, there are still things that are lacking in the learning process activities, such as teachers who are less active in motivating children, teachers who are less active in giving questions and answers to children, and teachers who are less active in giving examples, so this can result in some children lacking understand what is instructed by the teacher, as well as less capable children in carrying out counting activities using the finger method. The results of assessing children's performance in activities to develop cognitive abilities through counting using the finger method can be seen based on the percentage of learning completeness in the second cycle below:

Table 5

Percentage of Children's Learning Completeness in Cycle II

No	Results of child development assessments	Amount	Percentage
1	Complete	Child	85 %
2	Not finished yet	Child	15 %
Amount		Child	100 %

Based on the table of results of the percentage of children's learning completeness above, it can be seen that the level of learning completeness reached 85%, so that this learning activity can be said to be complete and there is no need for improvements in the next cycle.

a. In Cycle I

From the results of the assessment of numeracy learning activities using the Jarimatics method in cycle I, it is known that the numeracy skills of Group A children, namely 8 children or 60%, fall into the category of numeracy skills using the Jarimatika method. And 20 children or 40% have not yet finished. Because the children are still very young in using the Jarimatics method, some of them are still confused. Based on data analysis, it shows that teachers are not yet able to manage learning activities optimally. This can be seen from the students' activities in learning to count using the Jarimatika method in cycle I activities. There are still children who do not pay attention during the activities.

From the data analysis, it was found that students' activities using the Jarimatika method could develop children's numeracy skills. Meanwhile, teacher activities during learning activities are not optimal. This can be seen from the teacher's activities when extracting initial information.

b. In Cycle II

From the results of the assessment of numeracy learning activities using the jarimatka method in cycle II, it is known that the numeracy ability of group B children, namely 21 children or 87.70%, falls into the category of numeracy ability using the Jarimatika method. And 3 children or 13% have not yet finished.

Based on the percentage of completion, it has reached more than 75% so that the results of learning to count using the Jarimatika method are complete. Based on data analysis, it shows that teachers are able to manage learning activities optimally. This can be seen from the students' activities in learning to count using the Jarimatika method in cycle II activities. Children are more orderly, calm and can learn well.

From the data analysis, it was found that students' activities using the Jarimatika method could develop children's numeracy skills. Meanwhile, the teacher's activities during the learning activities were very good. This can be seen from the teacher's activities when delivering learning that is ready and the learning process is going well. The results of assessing numeracy skills using the finger method can be seen in table 4.10 below:

Table 6

Recapitulation of Cognitive Ability Performance Assessment through Numeracy Using the Jarimatika Method for Group A RA.AL-HIDAYAH Children, Negarasaka Village, Negerikaton District, Pesawaran Regency

No	Rating result	Pre cycle	Cycle action I	Action cycle II
1	★	26,67%	20%	0%
2	★★	33,34%	33,35%	13,33%
3	★★★	33,34%	20%	26,67%
4	★★★★	6,675%	26,675%	60%
AMOUNT		100%	100%	100%

From this research it is shown that the application of learning to count using the Jarimatika method can develop the cognitive abilities of children in Group A RA.AL-HIDAYAH, Negarasaka Village, Negerikaton District, Pesawaran Regency. This can be seen from the better the results of the assessment of children's numeracy development in cycle II. The factor for children's success in this activity is the experience that children have in learning cycles I and II, so that in the next cycle it runs well and smoothly. Children's learning outcomes increase with each cycle. Children who experience difficulties the teacher provides guidance and motivation so that they do not fall behind other children. After taking action until cycle II, learning completion reached 87.70% or 21 children. Apart from developing children's numeracy skills, using the Jarimatics method also increases learning activities for teachers and students.

CONCLUSIONS

The conclusion of this research is that learning using arithmetic using the finger method can be proven to be true, so that the hypothesis is accepted to improve cognitive abilities in students in Group A RA.AL-HIDAYAH, Negarasaka Village, Negerikaton District, Pesawaran Regency. The improvement can be seen from the children's learning completeness in developing gross motor skills which has increased, this can be seen from

the children's learning completeness in the Pras Cycle with a total of 40% completeness. then in cycle I it increased by 46.67%, and in cycle II the percentage of children's learning completion increased to 86.67%. It is hoped that it can provide correct education in forming students' personalities and produce a generation of intelligent, good personalities by continuously developing themselves with training and training to increase experience.

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