

Improving The Ability To Recognize Numbers In Group A Children Through Playing Foot And Hand Games At Galuh Anjani Paud

Irma Suryani^{*1}, Tuti Alawiyah², Juandra Prisma Mahendra³

^{1,2,3} Program Studi Pendidikan Anak Usia Dini (PAUD), STKIP Hamzar

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Abstract

One of the factors contributing to the low numeracy recognition ability of Group A children at PAUD Galuh Anjani is the use of inappropriate and insufficiently varied teaching methods and learning media. This study aimed to improve the number recognition ability of Group A children through the implementation of the Foot and Hand Games activity at PAUD Galuh Anjani in the 2025/2026 academic year. This study employed Classroom Action Research (CAR). The participants were 13 children in Group A (aged 4–5 years), consisting of 8 boys and 5 girls. Data were collected through observation, interviews, and documentation. The data were analyzed using descriptive qualitative methods. The success indicator was set at 80% of the 13 children achieving an individual mastery score of 75–100, categorized as Developing as Expected (BSH) and Developing Very Well (BSB) in number recognition ability. The study was conducted in two cycles, with each cycle consisting of two meetings. Each cycle included the stages of planning, implementation, observation, and reflection. The results of Cycle I showed an improvement in children's number recognition ability through the Foot and Hand Games activity. Before the intervention, only 5 children (38.4%) achieved the BSH and BSB categories, with an average score of 53. After the implementation of Cycle I, the number of children achieving mastery increased to 9 children (69.2%), with an average score of 70.3. Furthermore, the results of Cycle II demonstrated a significant improvement. The number of children who achieved the BSH and BSB categories increased to 11 children (84.6%), with an average score of 85.3.

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Corresponding Author:

Irma Suryani

STKIP Hamzar

Email: bt12021988@gmail.com,

1. INTRODUCTION

Early Childhood Education (PAUD) is an essential foundation for individual development, considering that during this period children experience very rapid growth and development. The age period of 0–8 years, often referred to as the golden age, is a critical period in various aspects of human development (Sujiono, 2021). The learning process at the PAUD level as a form of educational intervention must be managed by always paying attention to the unique characteristics of each stage of child development. Law Number 20 of 2003 concerning the National Education System, specifically Article 28 Paragraph (1), expressly mandates that early childhood education is provided for children from birth to six years and is a crucial development forum, although it is not an absolute prerequisite for attending basic education.

Optimizing education should be initiated from as early an age as possible. Education and stimulation received from parents, educators, and the surrounding environment will synergize to help children develop optimally according to their developmental stages. Developments that occur during this period significantly influence subsequent developmental trajectories, including

the cognitive dimension (Fitriani, 2021). Developing early childhood cognitive abilities can and should be done through a meaningful and enjoyable play approach. One of the most essential manifestations of basic cognitive abilities for early childhood is the ability to recognize numbers or numerals 1–10. The concept of number is essentially a critical mathematical foundation. This ability does not emerge instantly, but rather develops hierarchically and gradually, starting from the concrete stage when children explore and manipulate physical objects around them, which is then internalized through mathematical logic processes to the symbolic level (Dewi, 2023).

The cognitive development theory proposed by Jean Piaget (1964) suggests that preschool children (4-5 years old) are generally in the preoperational stage. At this stage, children begin to understand simple symbols, including numbers, but this understanding is still heavily based on empirical experience and play activities. Similarly, Noam Chomsky's Nativism Theory posits that children are naturally born with incredible innate potential, and the educator's task is to stimulate this latent potential to actualize it and structure it through an appropriate learning environment (Syannurdin & Hakim, 2022). Furthermore, Lev Vygotsky's view of the Zone of Proximal Development (ZPD) emphasizes that children's cognitive development is strongly influenced by social interactions and scaffolding (proportional assistance) from teachers or peers during learning activities (Sari, 2021).

The numeracy skills of children aged 4-5 years have specific characteristics. The main indicators include: the ability to correctly state the sequence of numbers 1-10, count quantities of objects one by one (one-to-one correspondence), recognize and point to the number symbols 1-10, and understand the concept of simple mathematical quantity comparisons such as "more," "less," or "equal to" (Sufira et al., 2022). The Child Development Achievement Level Standards (STPPA) also stipulate that recognizing number symbols is a basic competency achievement that must be facilitated by educators with adequate methods.

However, empirical reality in the field often does not align with these theoretical expectations. Based on the results of initial observations conducted at Galuh Anjani PAUD in group A (ages 4–5 years), it was identified that children's number recognition abilities were still very low. This problem was manifested in the inability of most children to name and sequence numbers correctly. Children often made mistakes in stating the sequence, such as jumping from the number 3 directly to the number 5, or failing to indicate the quantity of objects that represent the number mentioned (for example, asked to take 2 pencils but taking 4). The counting process became mechanical without conceptual understanding. Pre-action data validated this, where of 13 children, 5 children (38.4%) were in the Not Yet Developing (BB) criteria, 3 children (23.0%) were Starting to Develop (MB), and only 5 children (38.4%) achieved the Developing According to Expectations (BSH) criteria. Classical completion only reached 38.4%, far below the minimum completion standard set by the school, which was 80%.

An interview with the homeroom teacher, Ms. Sukarni, S.Pd., revealed the root of this problem. Numerical cognitive learning in the classroom is still dominated by conventional methods, such as the use of monotonous worksheets and verbal counting without the use of attractive teaching aids. Teachers have not maximized the use of kinesthetic play activities that suit the characteristics of children aged 4-5 years who are very physically active (Cardon & Maemunah, 2022). The use of minimal variety in media and methods causes children to quickly become bored, lack focus, and ultimately fail to internalize number concepts.

Addressing the urgency of these problems requires innovative methodological interventions that are relevant to the world of children. One prospective alternative solution is the implementation of the "Foot and Hand Games" play strategy. This term refers to kinesthetic educational games that involve the coordination of the soles of the feet and palms of the hands. These games are designed using banners or large manila paper printed or drawn with footprints and handprints along with the numbers 1-10 in colorful squares. Children are invited to play by jumping and planting their feet and hands in the correct pattern while identifying, naming, and matching number symbols. This method not only stimulates cognitive aspects but also combines

them with gross motor skills, balance, and eye-hand-foot coordination, which is believed to make learning much more meaningful and memorable (Hasanah et al., 2022).

Various previous studies have demonstrated the efficacy of physical and traditional games in enhancing children's cognitive and motor skills. Research by Raudah et al. (2022) confirmed that the use of number blocks significantly improves numeracy skills, while studies by JumiSyati et al. (2024) and Rais & Sit (2023) highlighted how movement games like hopscotch have a significant impact on early childhood participation and conceptual understanding. The essential difference between this study and previous studies lies in the specific integration of "Foot and Hand Games" media, which emphasizes the complexity of simultaneous sensorimotor coordination as a bridge to numerical understanding in group A children.

Based on the rationale above, this study aims to determine whether and to what extent the implementation of Foot and Hand Games improves the number recognition ability, specifically recognizing, counting, and naming number symbols 1-10, of group A children at Galuh Anjani PAUD in the 2025/2026 academic year.

2. RESEARCH METHODS

This study uses a Classroom Action Research (CAR) design. CAR was chosen because of its practical, reflective, and cyclical design characteristics, which are ideal for solving real-life problems faced by teachers in the classroom while simultaneously improving the quality of direct learning practices (Cahyono, 2023). The CAR design used in this study adopts the spiral model developed by Kemmis and McTaggart, which consists of four essential stages in a continuous cycle: (1) Planning, (2) Action Implementation, (3) Observation, and (4) Reflection.

This research was conducted at PAUD Galuh Anjani, located in Lendang Bagian Hamlet, Segara Katon Village, Gangga District, North Lombok Regency. The research time was allocated in the even semester of the 2025/2026 Academic Year, specifically from June to July 2026. The main subjects in this study were Class A students (in the age range of 4-5 years) totaling 13 children, with a demographic composition consisting of 8 boys and 5 girls.

To ensure the validity and reliability of the information obtained, this study utilized triangulation of data collection techniques, which include: (1) Participatory Observation, used to directly observe the learning process, activities, and responses of children when interacting with Foot and Hand Games media (Anggraini, 2021); (2) Tests/Performance, specifically designed in the form of game assignment instruments to measure children's individual cognitive achievements related to counting indicators, recognizing number symbols 1-10, matching the number of objects, and understanding the concept of number comparison; and (3) Documentation, which includes the Daily Learning Implementation Plan (RPPH), photographs of the implementation of actions, and archives of children's pre-action values.

The collected data was then analyzed using simple qualitative and quantitative descriptive analysis techniques (percentages) (Hidayat, 2021). The child development achievement scale was converted into four normative PAUD criteria, namely:

- 1) Not Yet Developing (BB): Score range 0-40. The child is still very dependent on full assistance from educators.
- 2) Beginning to Develop (MB): Score range 41-74. The child can perform tasks but still often needs guidance or reminders.
- 3) Developing as Expected (BSH): Score range 75-85. The child can complete tasks independently and consistently without facilitator intervention.
- 4) Very Well Developed (BSB): Score range 86-100. The child is not only independent but also able to take initiative, be creative, or even help his friends.

The success criteria (performance indicators) in this classroom action research were set with a target of at least 80% classical completeness. This means that the action cycle is declared successful and terminated if at least 80% of the total 13 children (approximately 11 children) have successfully achieved the minimum individual development achievement level of BSH (score $\geq$

75). If this indicator is not achieved in Cycle I, then strategy modifications will be made based on the results of reflection and continued in Cycle II.

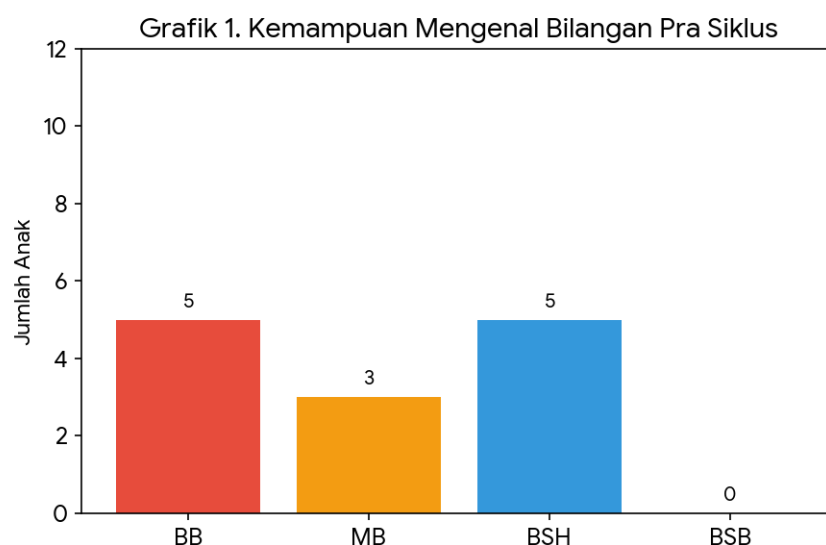
3. RESEARCH RESULTS AND DISCUSSION

1. Description of Initial Conditions (Pre-Cycle)

Before implementing the Foot and Hand Games intervention, researchers conducted a preliminary (pre-cycle) observation on June 6, 2026, to map the baseline of children's cognitive abilities in recognizing numbers. Field observations confirmed that the lecture method and routinely used LKA (Learning Worksheet) were ineffective in stimulating the enthusiasm of children aged 4-5 years. Children's concentration was very short, and their numerical understanding was artificial (only verbal memorization without understanding the meaning of numbers). The results of the pre-cycle observation assessment are presented comprehensively in Table 1 below.

No	Child's Name	Individual Score	Criteria
1	Thank you	75	BSH
2	Hope	40	BB
3	Hafiz	45	MB
4	Kabir	25	BB
5	Tea	55	MB
6	Rizky	75	BSH
7	Neighbor	30	BB
8	Nahum	60	MB
9	Yuri	75	BSH
10	Conversation	75	BSH
11	Ridwan	35	BB
12	Sekar	75	BSH
13	Years	35	BB

Based on Table 1, it is clear that the children's overall abilities are very concerning. Five children (38.4%) met the BB criteria, three children (23%) met the MB criteria, and only five children (38.4%) achieved the BSH criteria. The classical completion rate, which only reached 38.4%, with an average class score of 53, indicates the urgency of immediate learning improvements. This condition is also visualized in the following graph:



Graph 1. Visualization of Children's Abilities in the Pre-Cycle Stage

2. Implementation and Results of Cycle I

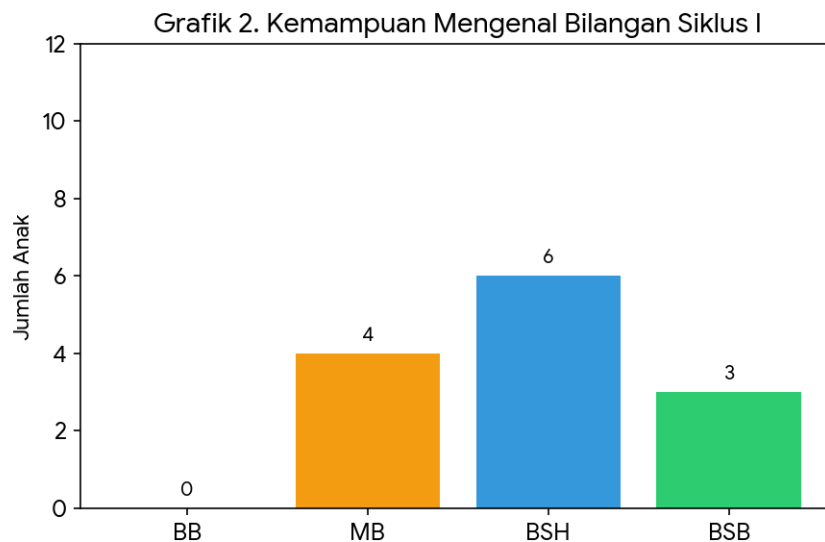
The actions in Cycle I were implemented in two face-to-face meetings, namely on Monday, June 8, 2026, and Tuesday, June 9, 2026, carrying the theme 'Communication Tools'. In the Planning stage, researchers together with class teachers prepared RPPH equipment,

designed assessment instruments, and specifically produced Foot and Hand Games media based on large printed banners. Each meeting lasted approximately 60 minutes (08.00-09.00 WITA) and was structured into three parts: a 10-minute opening (greeting, prayer, and warm-up movements), a 40-minute core activity centered on the Foot and Hand Games session, and a 10-minute closing (reflection and individual score recording). In the core Implementation stage, teachers began to socialize the rules of the game. Children were invited to take a number card at random, identify the number, then jump by placing their hands and feet on the trail on the banner according to the instructions for the sequence of numbers obtained. This sequence, one child completing a full trail turn before the next child began, was repeated so that each of the 13 children obtained at least two turns per meeting.

In the Observation stage, the researcher and the collaborating teacher jointly observed the ongoing action using an observation sheet covering children's enthusiasm, turn-taking behavior, and individual performance on the counting indicators, recorded in real time during each of the two meetings. Observations during Cycle I revealed that the children showed a significant increase in enthusiasm because the learning now involved fun, free-motor activities. They competed to jump correctly. However, there were still technical obstacles: some shy children were reluctant to participate because they felt they were being watched by the whole class, and the limited number of media resulted in long waiting times (queues), which led to children waiting in line tending to lose focus and create noise. The results of the final cognitive evaluation of Cycle I are summarized in Table 2.

No	Child's Name	Individual Score	Criteria
1	Thank you	80	BSB
2	Hope	75	BSH
3	Hafiz	75	BSH
4	Kabir	50	MB
5	Tea	75	BSH
6	Rizky	85	BSB
7	Neighbor	50	MB
8	Nahum	75	BSH
9	Yuri	85	BSB
10	Conversation	85	BSB
11	Ridwan	50	MB
12	Sekar	80	BSH
13	Years	50	MB

Empirical data from Table 2 shows the progressiveness of learning achievement. There were no children in the BB category (0%). There were 4 children in the MB category (30.7%). Six children (46.1%) reached the BSH completion threshold, and 3 children (23%) achieved BSB. Classical completion crept up to 69.2% with a class average score of 70.3. Although showing a positive trend, 69.2% is still far from the research success threshold (80%).



Graph 2. Visualization of Children's Abilities in Cycle I

In the Reflection stage of Cycle I, the collaborator team formulated a strategic improvement plan for Cycle II, namely: (1) Researchers and teachers will make a replica of the Foot and Hand Games media from manila paper so that the class can be divided into two small work groups, minimizing queuing time; (2) Teachers will intensify the persuasive approach for shy children; and (3) Introduction of a 'reward' system in the form of Star Pins for children who can complete the game mission to boost extrinsic motivation (Wibowo, 2025).

3. Implementation and Results of Cycle II

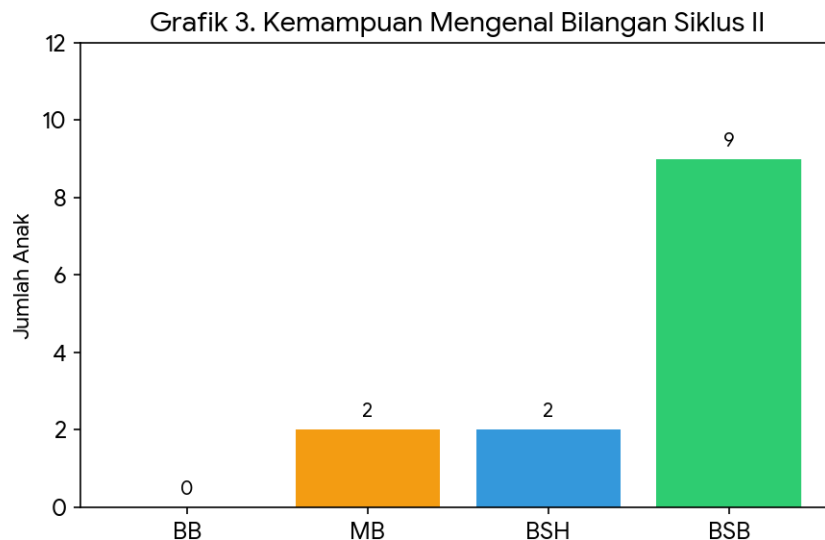
In the Planning stage of Cycle II, the researcher and the class teacher revised the RPPH based on the Cycle I reflection, prepared a second Foot and Hand Games banner to form two parallel circuits, and prepared small wooden blocks and Star Pin badges as new instructional materials. Based on the reflection results, Cycle II was held on June 15 and 17, 2026, with the same 60-minute session structure as Cycle I (10-minute opening, 40-minute core activity, 10-minute closing). In the Action stage, the learning scheme was revised. The classroom was modified with two simultaneous Foot and Hand Games circuits, halving the queue length experienced in Cycle I. The teacher opened the class by promising a 'Star Pin' for active participants. The game mechanics were increased in complexity: in addition to tracing, children were also asked to carry concrete objects (such as small blocks) whose quantity had to match the number they stepped on. This approach successfully accommodated the transitional attachment aspect from real (concrete) objects to the recognition of abstract (symbolic) symbols as theorized by Piaget (Dewi, 2023).

In the Observation stage of Cycle II, using the same observation sheet as Cycle I, the researcher and collaborating teacher recorded children's participation across the two circuits at each meeting. Observations in Cycle II revealed a much more conducive and interactive classroom dynamic. Grouping reduced students' free time, and healthy competition for stars encouraged shy students to show off their skills. Measurements of students' performance at the end of Cycle II are presented in Table 3.

No	Child's Name	Individual Score	Criteria
1	Thank you	90	BSB
2	Hope	90	BSB
3	Hafiz	95	BSB
4	Kabir	75	BSH
5	Tea	90	BSB
6	Rizky	95	BSB
7	Neighbor	75	BSH
8	Nahum	90	BSB
9	Yuri	95	BSB

10	Conversation	90	BSB
11	Ridwan	65	MB
12	Sekar	95	BSB
13	Years	65	MB

Table 3 shows a very encouraging performance increase. The BB status remained at 0. The MB status decreased drastically to only 2 children (15.3%). The graduation rate dominated, with 2 BSH children (15.3%) and BSB students increasing to 9 children (69.2%). Thus, a total of 11 children (84.6%) completed their studies, with an average equivalent score of 85.3.



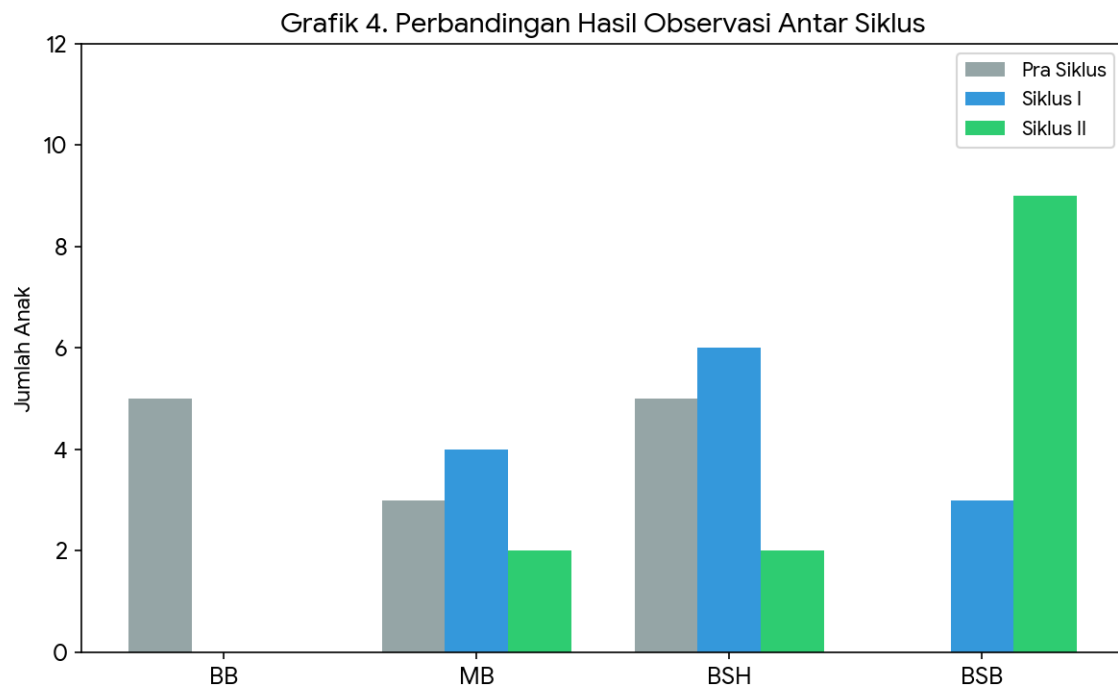
Graph 3. Visualization of Children's Abilities in Cycle II

In the Reflection stage of Cycle II, because the classical completion rate (84.6%) has exceeded the minimum standard of success indicators set at 80%, based on the collaborative reflection meeting, the PTK intervention process was decided to be sufficient and ended in Cycle II.

4. Inter-Cycle Discussion

The concept of number is a fundamental element in mathematical literacy. The ability to compare, categorize, and connect symbols and quantitative values must be stimulated using a methodology that is coherent with children's neurocognitive abilities (Zega, 2022). The use of Foot and Hand Games in this study proves the validity of the thesis that early childhood absorbs intellectual information optimally when it is channeled through kinesthetic and gross motor activity channels (Gunawan, 2024). While playing, children unconsciously activate their multiple intelligences: visual-spatial when observing the shape of footprints and the location of numbers, kinesthetic when jumping and balancing, and logical-mathematical when counting steps and objects. A comparison of children's developmental acceleration from the pre-cycle to the final cycle can be clearly observed in Table 4 and Graph 4.

Criteria	Pre Cycle	Cycle I	Cycle II
BB	5 (38,4%)	0 (0%)	0 (0%)
MB	3 (23,0%)	4 (30,7%)	2 (15,3%)
BSH	5 (38,4%)	6 (46,1%)	2 (15,3%)
BSB	0 (0%)	3 (23,0%)	9 (69,2%)
Completeness	38,4%	69,2%	84,6%



Graph 4. Comparison of Children's Cognitive Development Between Cycles

The transformation of completion from 38.4% to 69.2% and then peaking at 84.6% proves that careful instructional adaptation plays a crucial role. Improved classroom management in Cycle II by adding media (Lestari, 2025) successfully reduced the boredom of waiting in line, increased the intensity of children's interaction with number concepts, and providing rewards was proven to eliminate psychological barriers such as shame. These findings strongly resonate with the research findings of Raudah et al. (2022) and Maulina et al. (2024) that games that require physical coordination wrapped in light competition rules determinantly strengthen conceptual memory retention in children's brains.

4. CONCLUSION

Based on a series of action implementations, data acquisition, and comprehensive analysis, it was concluded that the effective and convincing implementation of the Foot and Hand Games method was able to improve the number recognition ability of group A children (aged 4-5 years) at PAUD Galuh Anjani in the 2025/2026 Academic Year. This success was proven quantitatively through a continuous increase in the percentage of learning completion. In the pre-cycle stage, children's abilities in the completion category (BSH & BSB) only reached 38.4% with an average score of 53. After the Cycle I intervention, completion was raised to 69.2% with an average of 70.3. Through strategic improvements in group management and rewards, classical completion in Cycle II increased exponentially to 84.6% with a class average of 85.3, while meeting the set success indicator targets.

5. SUGGESTIONS

Referring to the conclusions and reflective findings, it is recommended to: (1) School Principals, to continuously support the procurement of various creative media made from cheap and environmentally friendly materials as a means of learning innovation; (2) Educators (Teachers), should continue to dare to explore and combine traditional and modern kinesthetic-based game methods in teaching abstract concepts (mathematics) to maintain children's enthusiasm for learning; (3) Parents/Guardians, are advised to adopt similar game principles in the home environment to foster numerical and physical stimulation that is in line with school; and (4) Further Researchers, it is highly recommended to replicate this research design in a wider range of age groups (e.g. group B aged 5-6 years) or combine Foot and Hand Games media with

other thematic approaches, in order to measure the breadth of effectiveness of its impact on various aspects of child growth and development.

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