Journal of Didactic Studies

Published by: Primary Teacher Education and Early Childhood Education Study Program
Universitas Pendidikan Indonesia, Cibiru Campus
Journal homepage: https://ejournal.upi.edu/index.php/jds

Improving Children's Mathematical Skills Through the Giant Snake and Ladder Game at Baitul 'Ulum Early Childhood Education Center

Alya Noerohmah, Rista Erika

STIT Al-Azami Cianjur, Indonesia
*Correspondence: E-mail: alyanr1207@gmail.com

ABSTRACTS

This study aims to improve the numeracy skills of early childhood through the giant snakes and ladders game. The subjects of this study were children in GROUP A at an early childhood education center, with 19 participants. This study used a classroom action research (CAR) approach conducted in two cycles, each consisting of planning, implementation, observation, and reflection stages. In cycle I, learning was focused on introducing the game and basic counting rules through group activities. The observation results showed that most children began to show interest and involvement in counting activities, although there were still limitations in student attendance. In cycle II, there was a significant increase in children's counting skills, both in counting numbers, sequencing numbers, and recognizing number symbols through game activities. A total of 13 children showed results that developed as expected (BSH). The results of this study indicate that the giant snakes and ladders game is effective in improving the counting skills of early childhood. This game not only stimulates cognitive abilities but also develops children's gross motor and socio-emotional aspects. Therefore, it is recommended that early childhood teachers use similar games as an alternative to make learning arithmetic interesting and enjoyable.

ARTICLE INFO

Article History:
Received 10 Jan 2024
Revised 05 Feb 2024
Accepted 06 Mar 2024
Available online 03 Apr 2024
Publication Date 01 Jun 2024

Keyword:
Concrete media,
Early childhood,
Early childhood education,
Numeracy skills,
Snake and ladder game.

1. INTRODUCTION

Numeracy is one of the basic aspects of early childhood cognitive development that is very important to master from an early age (Rahim, 2025). This skill is the foundation for understanding mathematics in later stages of education. However, in reality, many children still have difficulty recognizing numbers, counting, and understanding numerical concepts (Asran et al., 2026). Various factors such as learning methods, media used, and the roles of teachers and parents also influence the development of children's numeracy skills. Jean Piaget explains that numeracy skills are related to children's cognitive development: Preschoolers are in the pre-operational stage (2–7 years old) (Fatkhiyah, 2025). Children begin to use symbols (numbers, words, pictures), but are not yet able to think logically in a systematic manner. Counting at this stage is concrete and contextual, for example, using real objects (blocks, buttons, toys). The implications, children need concrete activities, such as counting physical objects, playing with numbers, role-playing with toy money, etc (Halamury, 2023). The snake and ladder game is one educational game that is highly relevant in supporting the development of early childhood counting skills. This game is designed with a board containing numbered squares from small numbers to larger numbers, equipped with ladders and snakes as game elements that add to the excitement. In the context of learning, the snake and ladder game not only serves as entertainment, but also as an effective means of introducing the concepts of numbers, basic arithmetic operations, and number sequencing in a concrete and fun way.

When children play snakes and ladders, they are required to roll the dice and count the number of steps according to the number that appears, then move the box based on the calculation results. This activity indirectly hones their counting skills through direct experience. Children learn to understand number sequences, add or subtract the number of steps, and recognize numbers visually and verbally. This process reinforces basic counting skills such as addition and subtraction naturally without pressure, as it is done in a fun playing atmosphere.

From the perspective of cognitive development theory, the use of snakes and ladders is in line with Piaget's view that early childhood is in the pre-operational stage, where children learn through concrete objects and real activities (Dini, 2021). Snakes and ladders provide a learning experience that is concrete, symbolic, and manipulative, which greatly helps children understand basic mathematical concepts. In addition, Vygotsky's theory of the zone of proximal development also supports the use of this medium because the game is played with peers or companions, resulting in social interaction that can help children develop counting skills through guidance and support.

By utilizing snakes and ladders, teachers or parents not only train children's cognitive abilities, but also build motivation to learn through competitive and challenging games. This is in line with the play-based learning approach, which is considered effective for early childhood education (Tukly et al., 2025). Therefore, snakes and ladders can be considered a relevant and strategic learning tool in developing children's numeracy skills in a holistic and fun way.

DOI: http://dx.doi.org/10.17509/jds.v2i1.97181
p- ISSN 2987-856X e- ISSN 2987-7512

Based on observations in group A at Baitul 'Ulum Early Childhood Education Center, some children had difficulty recognizing numbers, counting, and understanding numerical concepts. This could be due to learning methods that were not interesting and did not suit the developmental characteristics of early childhood, which tends to favor play activities. One method that can be used to overcome this problem is educational games, such as giant snakes and ladders.

Through this game, children can learn to count in a fun, active, and contextual way. Playing is not only a means of entertainment for early childhood, but can also be an effective learning medium, especially in improving counting skills (Fachrudi et al., 2024). With a fun approach that is appropriate for children, the learning process will be more meaningful and easier to understand. Therefore, it is important to research and develop game-based counting learning strategies to support optimal cognitive development in children from an early age (Arumsari et al., 2024). This study was conducted to determine the effect of using the giant snakes and ladders game on the counting skills of children in group A at the Baitul 'Ulum Early Childhood Education Center.

2. METHODS

A research design is a plan and structure of research that is arranged in such a way that researchers will obtain answers to their research questions. The implementation process is carried out in stages until the research is successful. The action procedure begins with (1) action planning, (2) action implementation, (3) observation and evaluation, and (4) analysis and reflection (Rukminingsih et al., 2020). This research uses the classroom action research (CAR) method. This is because the purpose of this research is to improve learning practices in early childhood education in the area of early childhood mathematics through the use of snakes and ladders learning media. The research subjects were 20 students in group A of the Baitul 'Ulum Early Childhood Education Center, aged 4-5 years, some of whom had underdeveloped counting skills and some of whom had very well-developed skills.

3. RESULTS AND DISCUSSION

3.1 Cycle I Research Results

Researchers began conducting research activities in this first cycle on May 29, 2025, by implementing learning using group methods, play-based learning, and question and answer sessions. The first cycle of activities aimed to determine students' initial abilities in counting, recognizing numbers, and ordering basic numbers.

a. Planning

In this planning stage, the teacher helped facilitate the learning media that would be used that day. In the planning for Cycle I, the teacher focused on:

a) Explaining the activities that would be carried out that day.

DOI: http://dx.doi.org/10.17509/jds.v2i1.97181
p- ISSN 2987-856X e- ISSN 2987-7512

b) Explaining what games we would play that day.
c) The teacher helped stimulate the students' creativity to spark questions about the learning media that would be used that day.
d) The teacher reinforces the students' learning for the day.

b. Implementation

During Cycle I, the teacher explains the rules that will be played that day so that students apply discipline while playing.

• Initial Activities
a) Checking student readiness.
b) Motivating students as an apperception activity.
c) Conveying learning objectives.
d) The teacher provides a brief overview of the meeting in cycle I.
e) The teacher explains the rules of the game to be played.

• Core Activities
a) Teachers form groups based on students' names and abilities.
b) Teachers instruct students on the rules of the game.
c) Students begin the game by throwing the dice. The dice must land on the number 6. If the number 6 appears, students must throw the dice again according to the number that appears, then jump to the number they are aiming for.

• Closing Activities
a) The teacher asks the students to reflect on which games they liked.
b) The teacher explains the follow-up for the next activity.
c) The teacher closes the lesson with a prayer.

Table 1. Observation notes

No.	Student Name	Learning Objectives	NYD	BTD	DAE	DVW
1	Sahal	- Children do not give up easily when faced with challenges -Children perform activities using objects that involve large muscle movements (legs, hands, and head) -Children demonstrate an understanding of one-to-one correspondence using concrete objects -Children name the position of objects they see in relation to other objects (above, below, behind, beside, in front)			√	

DOI: http://dx.doi.org/10.17509/jds.v2i1.97181
p- ISSN 2987-856X e- ISSN 2987-7512

2	Azkiya	-Children do not give up easily when faced with challenges. -Children perform activities using objects that involve large muscle movements (legs, hands, and head). -Children demonstrate an understanding of one-to-one correspondence using concrete objects. -Children name the position of objects they see. -Children name the position of objects they see.			√	
3	Ghani	-Children do not give up easily when faced with challenges. -Children perform activities using objects that involve large muscle movements (legs, hands, and head). -Children demonstrate an understanding of one-to-one correspondence using concrete objects. -Children name the position of objects they see. -Children name the position of objects they see.			√	
4	Hazira	-Children do not give up easily when faced with challenges -Children perform activities using objects that involve large muscle movements (legs, hands, and head) -Children demonstrate an understanding of one-to-one correspondence using concrete objects -Children mention the position of objects they see			√	

DOI: http://dx.doi.org/10.17509/jds.v2i1.97181
p- ISSN 2987-856X e- ISSN 2987-7512

5	Alina	-Children do not give up easily when faced with challenges. -Children perform activities using objects that involve large muscle movements (legs, hands, and head). -Children demonstrate an understanding of one-to-one correspondence using concrete objects. -Children name the position of objects they see. -Children name the position of objects they see.			√	

Information

NYD: Not Yet Developed

BTD: Beginning To Develop

DAE: Developing As Expected

DVW: Developing Very Well

Based on the observations that have been made, the following has been observed in the learning activities:

Table 2. Observed in the learning activities

No.	Student Name	Activities	Achievement
1	Sahal	Already interested and counting numbers on the snakes and ladders board.	DAE
2	Azkiya	Jumping on the numbers instructed by the teacher	DAE
3	Ghani	Sequencing basic numbers	DAE
4	Hazira	Writing the numbers instructed by the teacher on the board while their friends jump on the numbers on the board	DAE
5	Alina	Not yet willing to play on the snakes and ladders board, only watching	DAE

For observation in cycle I, because all of the students happened to be absent that day, only five students were able to play the snake and ladder game, so further observation was conducted in cycle II.

a. Reflection

The results of the reflection on cycle I are that although there were still some difficulties encountered, such as the small number of students, the implementation of the snake and ladder game in cycle I went quite well. This can be seen from the enthusiasm shown by the students in participating in the learning process and the games played.

DOI: http://dx.doi.org/10.17509/jds.v2i1.97181
p- ISSN 2987-856X e- ISSN 2987-7512

3.2 Cycle II Research Results

a. Planning

In this planning result, the teacher helps facilitate the learning media that will be implemented on that day. In this cycle II planning, the teacher focuses on:

a. Conveying the activities that will be carried out today using the exercise method at the beginning of the activity.
b. Conveying what games we will play today with different rules.
c. The teacher helps explore the students' creativity to spark questions about the learning media that will be played today.
d. The teacher reinforces the students' learning for the day.

b. Implementation

In Cycle II, the teacher explains the rules that will be played that day so that students apply discipline while playing.

• Initial Activities

a. Checking student readiness.
b. Motivating students as an apperception activity.
c. Conveying learning objectives.
d. The teacher provides a brief overview of the meeting in Cycle II.
e. The teacher explains the rules of the game that will be played using a different method from cycle 1

• Main Activity

a. The teacher forms groups with the rule of pairing up with a groupmate of their choice.
b. The teacher instructs the game activity by explaining the rules.
c. After determining the groups, the group leaders play rock-paper-scissors to determine who plays first.
d. Students play at the beginning using the rules instructed by the teacher
e. Students are very enthusiastic when competing with their friends
f. At the end of the game the teacher allows students to play freely with whatever game they want once the game is over.

• Closing Activities

a. The teacher asks students to reflect on which games they liked.
b. The teacher thanks the students for following the rules today.
c. The teacher writes down today's observations.
d. The game session ends.

DOI: http://dx.doi.org/10.17509/jds.v2i1.97181
p- ISSN 2987-856X e- ISSN 2987-7512

Table 3. Aspec development

Date	Student Name	Event	Aspect Development	Achievement
June 2 2025	Adzkiya Almaeera	Adzkiya counts dice	Cognitive	DAE
	Alina	Ananda is able to count the number of snakes on the game board	Cognitive	DAE
	Aghnia	Aghnia tries to find the numbers instructed by the teacher	Physical motor and cognitive	DAE
	Khanaya	Khanaya Counts the number of dice correctly according to the number of dots Counts the steps in the snake ladder	Cognitive	DAE
	Sultan	Sultan counts the numbers from 23 to 30	Cognitive	DAE
	Makki	Makki Counting the number of squares on the snakes and ladders board	Cognitive	DAE
	Ghani	Ghani Inviting his friends to play snakes and ladders	Social emotional	DAE
	Refan	Refan Playing dice by throwing them together with his friends	Social emotional	DAE

a. Reflection

The use of the giant snakes and ladders game requires students to play an active role in both counting and working in groups with their friends. The motor skills activities involved in the game enable students to perform well. This is evidenced by the improvement in student learning outcomes from cycle I to cycle II.

3.3 Discussion

3.3.1 Discussion of Cycle I

The learning process in cycle I began to show good progress. The children became interested and curious about the educational snake and ladder game that was brought in and asked questions about what would be done that day. In the initial learning process, student activity and motivation were not yet apparent. This was because the learning process was still rigid and the flow was not yet clear.

In the learning process in cycle I, student activity began to be visible and student motivation in the learning process also began to develop with the knowledge of basic numbers. Their ability to count was in line with the theory presented by Jean Piaget's Preoperational Stage (ages 2-7): Children begin to understand symbols and numbers, but still think concretely. At

DOI: http://dx.doi.org/10.17509/jds.v2i1.97181
p- ISSN 2987-856X e- ISSN 2987-7512

this stage, children begin to develop their counting skills through symbolic games, concrete objects, and manipulative activities. Teachers need to use real (concrete) objects such as blocks, buttons, or pictures to introduce number concepts and counting operations. By using the giant snakes and ladders game, students can learn numbers through concrete objects or symbols.

3.3.2 Discussion of Cycle II

Cycle II consists of planning, observation, and reflection activities. In this cycle, the implementation of the snakes and ladders game was the same as that applied in Cycle I. It showed an increase in the conducive nature of learning with the snakes and ladders game in terms of cognitive development by improving counting skills through the giant snakes and ladders medium. A total of 13 students were able to count using basic counting patterns out of 19 students. Six students were absent in Cycle II.

4. CONCLUSION

Based on the results of classroom action research (CAR) conducted in two cycles, it can be concluded that the use of giant snakes and ladders games can significantly improve the numeracy skills of early childhood students in group A. In cycle I, learning began to show positive results despite limitations in student attendance and adaptation to the learning media. The children began to show interest in naming and sequencing basic numbers through concrete and fun games. In cycle II, there was a more significant increase in terms of student engagement, activity in the game, and cognitive ability in recognizing and sequencing numbers. This can be seen from the increase in the number of children who reached the "Developing as Expected (BSH)" category in the aspects of counting and social-emotional. Thus, the use of giant snakes and ladders games can be an effective and fun alternative in improving the counting skills of early childhood, while also developing motor, social, and cognitive aspects in an integrated manner.

5. REFERENCES

Arumsari, A. D., Setyawan, D., Dzulkifli, D., & Marini, M. (2024). Peningkatan perkembangan kognitif anak usia dini (AUD) melalui alat permainan edukatif (APE) papan berhitung. *MOTIVA: JURNAL PSIKOLOGI*, *7*(2), 164–170. https://doi.org/10.31293/mv.v7i2.8314

Asran, A. S., Cahyani, D. N., Selvi, & Idawati. (2026). Analisis kesulitan belajar matematika siswa kelas I sekolah dasar. *Didaktik: Jurnal Ilmiah PGSD STKIP Subang*, *12*(01), 190–204. https://doi.org/10.36989/didaktik.v12i01.11875

Dini, A. S. (2021). *Pengembangan media permainan ular tangga untuk meningkatkan kognitif anak usia 5-6 tahun* [Undergraduate, UIN Raden Intan Lampung]. https://repository.radenintan.ac.id/13815/

Fachrudi, D. S., Marsidi, M., & Agustin, I. H. (2024). Peningkatan kemampuan literasi dan numerasi melalui media pembelajaran ular tangga di SDN Sukorejo 6. *Dedication: Jurnal Pengabdian Masyarakat*, *8*(1), 41–48. https://doi.org/10.31537/dedication.v8i1.1703

DOI: http://dx.doi.org/10.17509/jds.v2i1.97181
p- ISSN 2987-856X e- ISSN 2987-7512

Fatkhiyah, L. (2025). *Permainan dadu angka dalam meningkatkan kemampuan numerasi pada anak usia 4-5 tahun di pos PAUD Permata Pelang Mayong Jepara* [Masters, Universitas Ivet]. https://eprint.ivet.ac.id/id/eprint/122/

Halamury, M. F. (2023). Penggunaan alat permainan edukatif play dough untuk merangsang kecerdasan logis-matematis anak usia dini di kelompok bermain ROVILA Kota Ambon | *INSTITUTIO: Jurnal Pendidikan Agama Kristen*. https://e-journal.iaknambon.ac.id/index.php/IT/id/article/view/293

Rahim, A. (2025). Pentingnya mengembangkan kemampuan literasi dan numerasi sejak usia dini di daerah Makassar. *SABAJAYA Jurnal Pengabdian Kepada Masyarakat*, *3*(04), 246–252.

Rukminingsih, Adnan, G., & Latief, M. A. (2020). *Metode penelitian pendidikan penelitian kuantitatif, penelitian kualitatif, penelitian tindakan kelas*. Erhaka Utama.

Tukly, W. V., Nilapancuran, M. M., Matital, K. A., Kothel, S., & Lesbassa, L. (2025). Membangun fondasi pendidikan anak usia dini melalui pendekatan pembelajaran yang menyenangkan. *CARONG: Jurnal Pendidikan, Sosial Dan Humaniora*, *2*(2), 754–764. https://doi.org/10.62710/vp1c3790

DOI: http://dx.doi.org/10.17509/jds.v2i1.97181
p- ISSN 2987-856X e- ISSN 2987-7512