

Serial Picture Media: A Strategy to Optimize Logical

Thinking Ability in Children Aged 5–6 Years

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ABSTRACT

This study was motivated by the low logical thinking ability of children aged 5–6 years, as indicated by their limitations in classifying, sequencing, and comparing. The study aimed to improve children's logical thinking ability through the use of serial picture media. This research is a classroom action research conducted at TK Pertiwi Sri Hastuti Simbang with 32 children as subjects. The research was carried out in two cycles with four meetings, which included the stages of planning, implementation, observation, and reflection. The pre-research results showed that the logical thinking ability of children aged 5–6 years was still dominated by the categories of Not Yet Developed (BB) and Beginning to Develop (MB). After the intervention in Cycle I, children's logical thinking ability increased with an average achievement of 56.24%. A more significant improvement occurred in Cycle II, where the average achievement of children's logical thinking ability reached 81.25%. The results of this study indicate that the use of serial picture media can improve the logical thinking ability of children aged 5–6 years.

Introduction

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Early childhood (EC) refers to individuals who hold strategic value and an important role in the stages of growth and development (Erifkha & Zulfahmi, 2024). Early childhood encompasses individuals within the age range of 0–6 years who are in the most fundamental phase of development in forming cognitive abilities, including logical thinking ability (Yusuf et al., 2023). This period is characterized by high sensitivity to environmental stimuli, so appropriate stimulation greatly influences children's readiness to learn in the future (Afnita & Latipah, 2021). The learning process in early childhood takes place through exploration and direct interaction with the surrounding environment (Windayani et al., 2021).

Early Childhood Education (ECE) is a form of education aimed at supporting the development of various aspects of children (Fitria & Rahmawati, 2021). ECE plays a strategic role as a medium for providing directed and continuous stimulation of child development (Sulistianingsih et al., 2022). Learning at the ECE level is designed through a play-based approach so that children are actively involved and obtain learning experiences in accordance with their developmental stage (Elihami & Ekawati, 2020).

According to Piaget, children's cognitive development occurs through systematic stages, in which children actively construct their knowledge through interaction with their surrounding environment (Pakpahan & Saragih, 2022). Children's cognitive development progresses gradually, starting from the sensorimotor stage,

preoperational stage, concrete operational stage, to the formal operational stage, each of which reflects the enhancement of thinking ability from concrete experience toward logical and abstract reasoning (Piaget in Laksana et al., 2021).

The cognitive development aspect of early childhood includes logical thinking ability related to activities such as grouping, sequencing, and understanding simple cause-and-effect relationships (Rajamuddin, 2025). Logical thinking ability is a rational thinking process used to connect knowledge and experience in drawing conclusions and understanding causal relationships (Liber et al., 2024).

Ristyadewi and Fitria (2023) state that cognitive processes enable children to understand relationships between differences, patterns, and cause-and-effect within a phenomenon. At the age of 5–6 years, this ability develops rapidly, marked by children's ability to sequence, classify, recognize patterns, distinguish sizes, and demonstrate more structured thinking (Monika et al., 2023). Stimulation of logical thinking ability needs to be carried out through activities that are in accordance with the thinking characteristics of early childhood (Yusuf et al., 2023). Picture media are considered effective in supporting children's cognitive development because they can present information that attracts children's attention (Raoza, 2024). Research findings (Setiawati et al., 2024) indicate that the use of picture media has a positive influence on the learning process. Serial picture media present a sequence of events in order, thereby encouraging children to think systematically

(Astuti & Rambe, 2024).

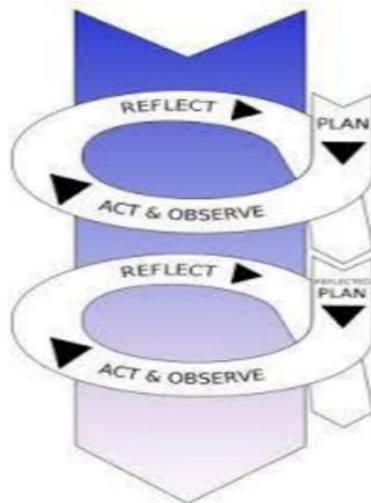
Various previous studies have shown that serial picture media contribute positively to early childhood logical thinking ability through activities of observing, arranging, and interpreting sequences of events (Haryono, 2023). This media also helps children understand the interrelationships between events and trains sequential thinking skills (Monika et al., 2023). Astuti and Rambe (2024) in their study emphasized that the use of serial pictures can increase children's active involvement in the cognitive learning process.

The results of the initial observation at TK Pertiwi Sri Hastuti Simbang indicated that the logical thinking ability of children aged 5–6 years had not developed optimally. Children still experienced difficulties in sequencing information, classifying, and comparing objects. This condition indicates the need for a more innovative and concrete media-based learning strategy to stimulate children's logical thinking ability.

Methods

This study employed the Classroom Action Research (CAR) method using the Kemmis and McTaggart model, which allows researchers to systematically and continuously design, implement, observe, and reflect on instructional actions (Machali, 2022). The research was conducted in two cycles, where each cycle consisted of the stages of planning, action implementation and observation, and reflection.

Figure 1. Research Design of Kemmis and McTaggart (Haryanto & Rohani, 2024)



The planning stage was carried out by identifying learning problems based on the results of initial observations of the logical thinking ability of children aged 5–6 years. Based on these findings, the researcher prepared the Daily Lesson Plan (RPPH) integrating the use of serial picture media. This media was selected because it is in line with Piaget’s cognitive development theory, which states that children aged 5–6 years are in the preoperational stage toward the concrete operational stage, thus requiring visual stimuli to assist the logical thinking process (Laksana et al., 2021).

At the action implementation stage, learning was carried out using serial picture media through the following steps: (1) children observed the serial pictures presented by the teacher, (2) children identified the content of the pictures and predicted the relationships between events,

(3) children arranged, classified, or compared the pictures according to the indicators of logical thinking ability, and (4) children retold the results of the picture arrangement using their own language. These steps are in accordance with the constructivist approach, which emphasizes that children build their knowledge through direct activities and interaction with the environment (Pakpahan & Saragih, 2022).

Observation was conducted simultaneously with the implementation of the action to observe children's activities and logical thinking ability. Research data were collected through observation and documentation techniques. The research instrument included indicators of classifying objects based on color, shape, and size; sequencing size, time, and stories; and comparing objects based on big-small, low-high, many-few, and long-short. The instrument was developed through the formulation of indicators and a validation process to ensure its suitability with the developmental characteristics of early childhood (Sugiyono, 2019).

The reflection stage was conducted at the end of each cycle by analyzing the results of observation and the assessment of children's logical thinking ability. The reflection results were used as a basis for planning improvements in learning in the subsequent cycle, either in the form of refining the serial picture media, providing more directed stimulus questions, or improving the teacher's assistance strategy during the activities.

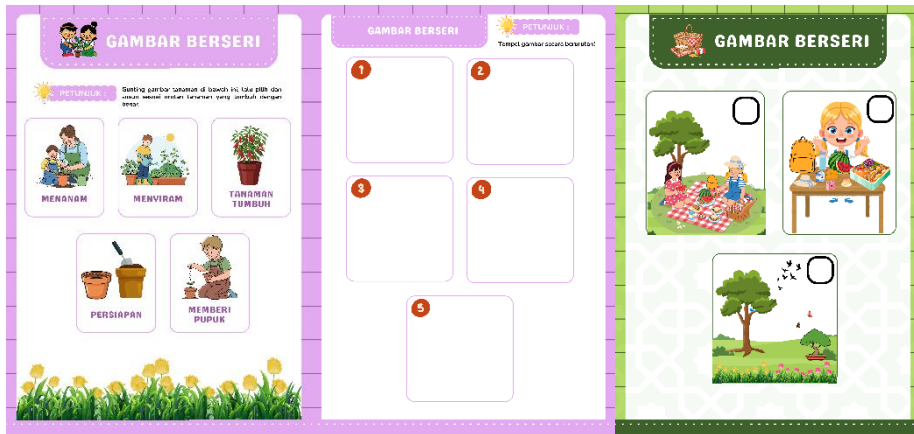
The success indicator in this study was determined when at least 75% of the children reached the category of Developing as Expected (BSH) or Developing Very Well (BSB) in logical thinking ability. The achievement of this indicator was used as a benchmark for the success of implementing serial picture media in improving the logical thinking ability of children aged 5–6 years.

Result and Discussions

This classroom action research was conducted on children aged 5–6 years at TK Pertiwi Sri Hastuti Simbang, totaling 32 children, consisting of 15 girls and 17 boys. This study aimed to improve children’s logical thinking ability through the use of serial picture media. The research was carried out in two cycles with a total of four meetings, which included the stages of planning, implementation and observation, and reflection.

Figure 2. Serial Picture Media





Before the action was implemented, the researcher conducted a pre-research to determine the initial condition of children’s logical thinking ability based on three sub-variables, namely classifying (grouping), seriation (sequencing), and comparing.

Table 1. Indicators of Logical Thinking Ability of Children Aged 5–6 Years

Variable	Sub-Variable	Indicator
Logical thinking	Classifying (grouping)	Classifying objects based on color, shape, and size
	Seriation (sequencing)	Sequencing size, time, and stories
	Comparing	Comparing based on big-small, low-high, many-few, and long-short

The results of the pre-research showed that 15 out of 32 children (46.88%) were in the Not Yet Developed (BB) category and 11 children

(34.37%) were in the Beginning to Develop (MB) category. Meanwhile, only 6 children (18.75%) had reached the Developing as Expected (BSH) category, and no children had reached the Developing Very Well (BSB) category. This condition indicates that children's logical thinking ability before the intervention was still relatively low, thus improvement efforts were necessary.

Table 1. Logical Thinking Ability of Children Aged 5–6 Years Based on Developmental Categories in the Pre-Research

No	Developmental Category	Number of Children	Percentage (%)
1	Not Yet Developed (BB)	15	46.88%
2	Beginning to Develop (MB)	11	34.37%
3	Developing as Expected (BSH)	6	18.75%
4	Developing Very Well (BSB)	0	0%

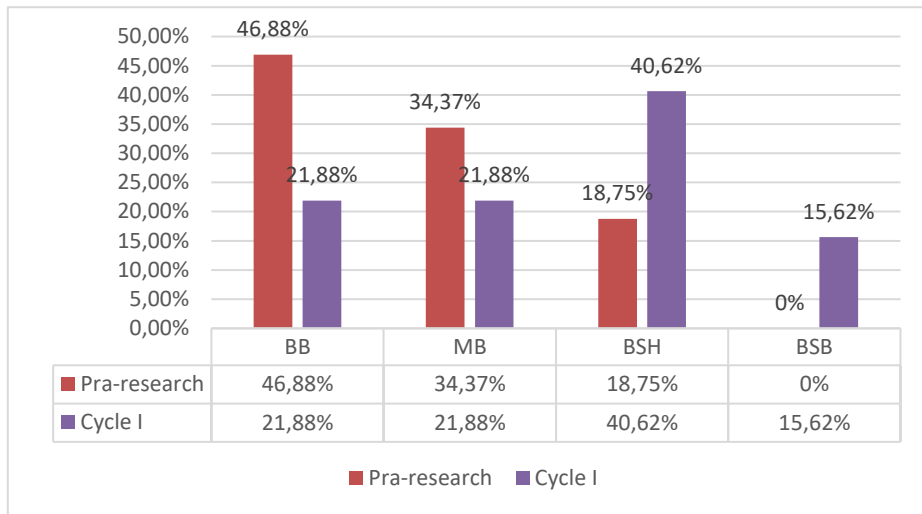
Based on the above condition, learning actions were carried out through two cycles. Cycle I focused on the introduction of serial picture media and habituating children to observe and arrange picture sequences. Cycle II was implemented with improvements in learning strategies based on the reflection results of Cycle I.

Table 2. Logical Thinking Ability of Children Aged 5–6 Years Based on Developmental Categories in Cycle I

No	Developmental Category	Number of Children	Percentage (%)
1	Not Yet Developed (BB)	7	21.88%
2	Beginning to Develop (MB)	7	21.88%
3	Developing as Expected (BSH)	13	40.62%
4	Developing Very Well (BSB)	5	15.62%
	Achievement (BSH + BSB)	18	56.24%

Children's logical thinking ability in Cycle I showed an improvement compared to the pre-research. The grouping of developmental categories indicated that out of 32 children, 13 children (40.62%) were in the BSH category and 5 children (15.62%) were in the BSB category. Meanwhile, 7 children (21.88%) were still in the BB category and 7 children (21.88%) were in the MB category. Overall, the average achievement of children's logical thinking ability in Cycle I reached 56.24%, which indicates an improvement compared to the pre-research. However, these results had not fully met the research success indicators, so the learning action was continued to Cycle II.

Figure 2. Comparison of Logical Thinking Ability of Children Aged 5–6 Years Based on Developmental Categories in the Pre-Research and Cycle I



Some children in Cycle I were still unable to classify objects consistently and sequence them properly. The reflection results showed that children were still adapting to the use of serial picture media and required more directed stimulus questions. Cycle II was conducted in two meetings with improvements in learning strategies based on the reflection results of Cycle I. The improvements included presenting more contextual serial pictures, providing guiding questions, and increasing opportunities for children to express their opinions.

Table 3. Logical Thinking Ability of Children Aged 5–6 Years in Cycle II Based on Developmental Categories

No	Developmental Category	Number of Children	Percentage (%)
1	Not Yet Developed (BB)	1	3.12%
2	Beginning to Develop (MB)	5	15.62%

3	Developing as Expected (BSH)	12	37.5%
4	Developing Very Well (BSB)	14	43.75%
	Achievement (BSH + BSB)	26	81.25%

The observation results in Cycle II showed a significant improvement. A total of 26 children had reached the BSH and BSB categories with an average achievement of 81.25%. This achievement had exceeded the predetermined success indicator; therefore, the learning action was declared successful and the cycle was terminated.

Figure 3. Comparison of Logical Thinking Ability of Children Aged 5–6 Years Based on Developmental Categories in Cycle I and Cycle II

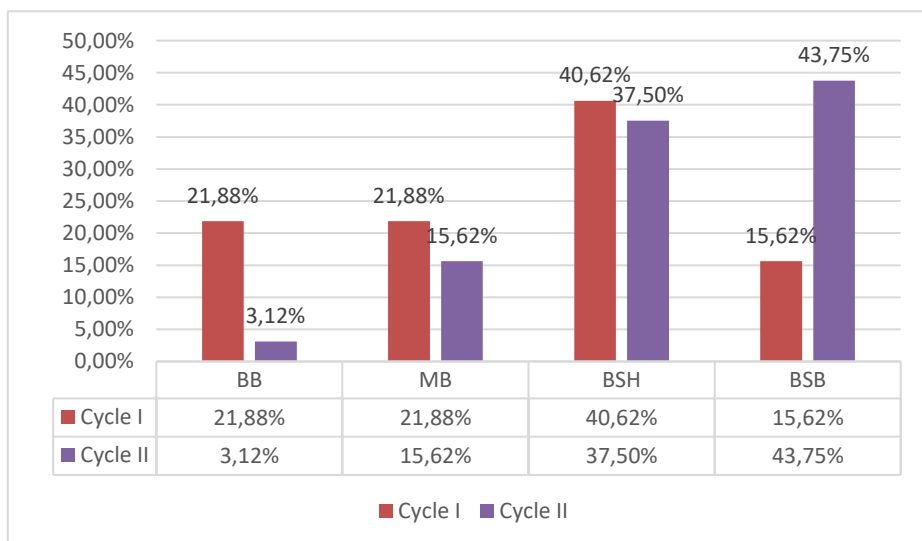


Figure 4. Logical Thinking Ability of Children Aged 5–6 Years Based on Developmental Categories from the Pre-Research to Cycle II

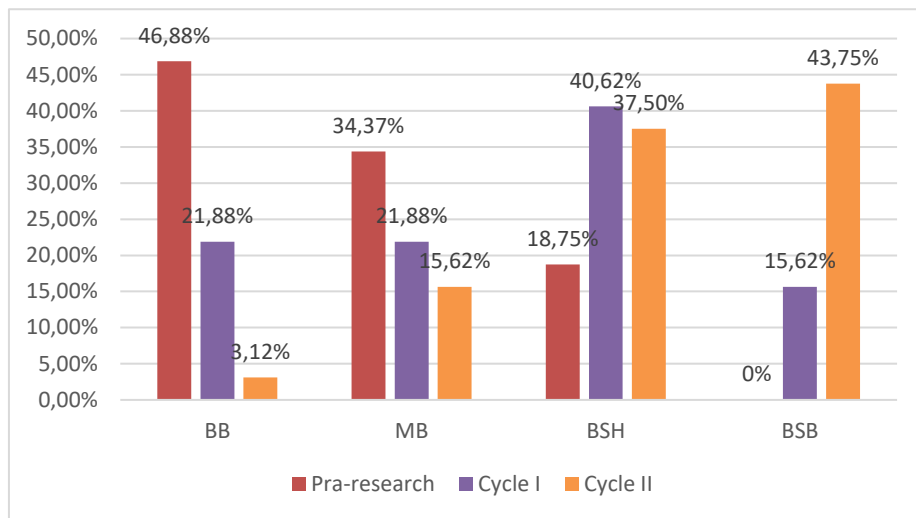


Figure 3 shows that the implementation of serial picture media was able to gradually improve the logical thinking ability of children aged 5–6 years from the pre-research to Cycle II. This improvement is indicated by the decreasing percentage of children in the Not Yet Developed (BB) and Beginning to Develop (MB) categories, as well as the increasing percentage of children in the Developing as Expected (BSH) and Developing Very Well (BSB) categories in each learning cycle.

Figure 3. Logical Thinking Ability of Children Aged 5–6 Years Based on Developmental Categories from Pre-Research to Cycle II

The serial picture media in this study were not only used to train seriation or sequencing ability but were also utilized to develop the ability to classify and compare objects. Children were not only asked to arrange picture sequences but also to group pictures based on certain similar characteristics and compare objects based on size, quantity, and other characteristics. This shows that serial picture media are flexible

and can be used to stimulate various aspects of logical thinking ability in an integrated manner.

The findings of this study are in line with previous research stating that visual media can support the development of logical thinking ability in early childhood. This study has novelty in the varied implementation of serial picture media. The media were not only presented in the form of numbered picture sheets but also through activities such as cutting and pasting pictures, as well as arranging serial pictures with different levels of complexity.

There was an increase in the complexity of the serial pictures used in each cycle. In Cycle I, the serial pictures were presented in a simple sequence consisting of three pictures. In Cycle II, the number and variation of serial pictures were increased to four to five pictures. This increase in complexity provided a higher level of cognitive challenge for children and encouraged the development of their logical thinking ability.

Conclusion

This classroom action research proves that the use of serial picture media can improve the logical thinking ability of children aged 5–6 years at TK Pertiwi Sri Hastuti Simbang. At the pre-research stage, most children were still in the Not Yet Developed (BB) and Beginning to Develop (MB) categories, with only 6 children (18.75%) out of 32 children having reached the Developing as Expected (BSH) category and no children in the Developing Very Well (BSB) category.

After the implementation of serial picture media in Cycle I, children's logical thinking ability increased, as indicated by the growing number of children who reached the BSH and BSB categories, with an average achievement of 56.24% (18 children). A more significant improvement occurred in Cycle II, where most children had reached the BSH and BSB categories with an average achievement of 81.25% (26 children), so the research success indicator had been achieved.

This improvement indicates that serial picture media implemented variatively and gradually, both through sequencing, classifying, and comparing activities, as well as with an increasing level of picture complexity from Cycle I to Cycle II, are effective in stimulating the logical thinking ability of early childhood. Based on the results and discussion above, it can be concluded that serial picture media are an alternative learning medium capable of developing and improving the logical thinking ability of children aged 5–6 years at TK Pertiwi Sri Hastuti Simbang.

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