

Stimulating Cognitive Abilities to Recognize Animals through Digital Games: *PUZOOVA (Puzzle Zoo Adventure)* BookWidgets Based on Kindergarten B Children

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Abstract

Cognitive abilities are a crucial aspect of early childhood development, particularly in understanding the environment, including animals. Conventionally, one-way learning methods are considered ineffective in optimizing children's active engagement. This study aims to describe the application of digital games. PUZOOVA (Puzzle Zoo Adventure) in stimulating cognitive abilities to recognize animals in Kindergarten B children aged 5-6 years at Kamilia PAUD. The study used a qualitative descriptive approach with 10 Kindergarten B children as subjects. Data collection techniques included participant observation, unstructured interviews, and documentation. The results showed that the use of Digital Games PUZOOVA had a significant positive impact on children's cognitive abilities in recognizing animals. Ninety percent of children successfully remembered animal names after the activity (BSB category), and 80% demonstrated high levels of enthusiasm and active engagement. The use of real-life animal images in an interactive digital puzzle format has been shown to broaden children's cognitive horizons, train logical reasoning, eye-hand coordination, and problem-solving skills in a fun and meaningful way.

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1. INTRODUCTION

Cognitive abilities are a crucial aspect of early childhood development. Children begin to understand their surroundings through the processes of thinking, remembering, observing, understanding, and solving problems. Through the various learning experiences they gain, children build new knowledge as a foundation for the development of thinking skills at later stages.

Developing cognitive abilities not only aims to prepare children for higher education but also helps them make decisions, understand various information, and adapt to their social environment. Well-developed thinking skills can help children become independent, creative individuals and be able to face various life challenges in the future. Therefore, optimal stimulation of cognitive abilities needs to be provided through learning activities that are appropriate to children's developmental characteristics (Zuva et al. 2025; Pahrul et al. 2021). One material that can be used to develop children's cognitive abilities is animal recognition. By introducing various animals, children can learn to identify animal names, characteristics, habitats, and the various characteristics of each type. Animal recognition material is very close to children's lives, making it an effective tool for developing critical thinking and observation skills. However, based on learning conditions found in the classroom, animal recognition is still often carried out using conventional methods such as

picture books and verbal teacher explanations, which results in children being less actively involved in the learning process (Yuntina 2023; Mardan 2025).

The development of digital technology is rapid. Technology-based learning games are increasingly used in early childhood education (PAUD). Teachers are starting to utilize digital tools, such as Book widgets, a web-based application that allows them to create interactive learning activities, including puzzle games. These puzzle games, which researchers call *Puzoova*, allow children to arrange animal picture pieces interactively on the touch screen using IFP at Kamilia PAUD, so that the experience of learning about animals becomes more concrete, fun, and meaningful.

Play is a fundamental right and need for children at an early age. Their cognitive abilities are formed not only through memorization, but also through active involvement in problem-solving through constructive play such as puzzles (Pratiwi 2017). Structured play methods can maximize children's collective cognitive function (Pahrul et al. 2021). Furthermore, play provides a means for children to express themselves without pressure, while optimally stimulating their moral, language, cognitive, motor, and social-emotional competencies (Rohmah 2016). This explanation demonstrates that play is an essential need for children, especially at an early age, and emphasizes that play is a primary source of their development. Game puzzle *Puzoova*, in particular, is known to develop children's cognitive abilities, including problem-solving skills. This puzzle is presented in an interactive digital format and features real-life animal images, increasing its potential for cognitive stimulation to help children solve problems.

Game puzzle digital *Puzoova* continues to innovate, with the transformation from conventional static puzzles into an interactive digital ecosystem that combines real animal visuals (real photo visuals) with problem-solving stimulation that involves various senses. Based on this condition, this study aims to describe how the *Puzoova* digital puzzle game based on Book widgets can be used as a tool to stimulate the cognitive abilities of 5–6-year-old kindergarten B children in recognizing animals. It is hoped that the results of this study can provide a reference for early childhood education teachers in utilizing appropriate and effective digital games to support children's cognitive development in the current technological era.

2. RESEARCH METHODS

This scientific article adopts a qualitative descriptive approach that aims to explore and describe the phenomena occurring in the field in detail and as they are (Sugiyono 2019). This approach was chosen because the researchers wanted to gain a comprehensive picture of how a digital puzzle game based on Book widgets can stimulate children's cognitive abilities in a real-life classroom learning context.

This research was conducted at Kamilia Early Childhood Education (PAUD) during the even semester of the 2025/2026 academic year. The subjects consisted of all 10 Kindergarten B children aged 5-6 years, comprising 4 boys and 6 girls. The class teacher also served as an informant in this study.

The game used is a digital puzzle developed through the Book widgets platform (bookwidgets.com). The puzzle features five types of animals, namely: (1) Echidna, (2) Hedgehog, (3) Sun Bear, (4) Kangaroo, and (5) Pangolin. Each puzzle features a picture of a real animal cut into several parts, which are then reassembled by children interactively using a touchscreen. The selection of diverse animals, including those that may not be familiar to all children, such as echidnas and pangolins, was done deliberately to broaden their cognitive insights about animal diversity.

The data collection used includes: (1) participatory observation, where researchers directly observe the learning process while recording children's behavior, responses, and

involvement; (2) unstructured interviews with class teachers to obtain information regarding children's cognitive development; and (3) documentation in the form of photos and videos of learning activities as empirical evidence of the implementation of the research.

Data analysis was conducted following the Miles and Hurman model (in Zaytun Hasanah 2021), which includes three steps: data reduction, data presentation, and conclusion drawing. Data validity was ensured through source and technique triangulation.

3. RESULTS AND DISCUSSION

3.1 Research result

Implementation of Digital Game learning media *Puzoova (Puzzle Zoo Adventure)* based on *Book widgets*. This activity was conducted with Kindergarten B children aged 5-6 years at Kamilia Early Childhood Education Center (PAUD). Learning activities were carried out according to pre-planned stages, namely opening activities, core activities, and closing activities. Each session used a single type of animal puzzle displayed on the IFP touchscreen. Children took turns and worked in groups to assemble the animal puzzle pieces scattered across the screen to create a complete picture.

The results of the observation revealed three main findings. (1) All children showed high enthusiasm and motivation when playing digital puzzles. This was evident from their cheerful facial expressions, eagerness to get a turn, and the children's tendency to repeat the game voluntarily. (2) Children were actively involved in the process of putting together the puzzle, including friends who were watching and also provided direction and encouragement to their friends who were playing. (3) After successfully putting together the puzzle, children were able to name animals and describe their physical characteristics simply, such as 'their body is spiky', 'they have a pouch on their stomach', and 'they have a long nose'.

Implementation of Digital Games *Puzoova* has a positive impact on children's cognitive abilities in recognizing animals. Based on the pre-test and post-test results, there was an increase in children's abilities across all observed indicators. A summary of the results of observations of children's cognitive abilities is presented in the following table.

Table 1. Results of the Pre-Test of Cognitive Ability to Recognize Animals

No	Observed Aspects	BB	MB	BSH	BSB
1	Name the animals correctly	2	6	2	0
2	Describe the physical characteristics of animals	3	5	2	0
3	Match the puzzle pieces correctly	4	4	1	1
4	Enthusiasm and active involvement	1	6	2	1
5	Remembering the names of animals after the activity	2	5	2	1

Description: BB = Not Yet Developed; MB = Starting to Develop; BSH = Developing as Expected; BSB = Developing Very Well.

Table 2. Post-Test Results of Cognitive Ability to Recognize Animals through Games PUZOOVA (Puzzle Zoo Adventure)

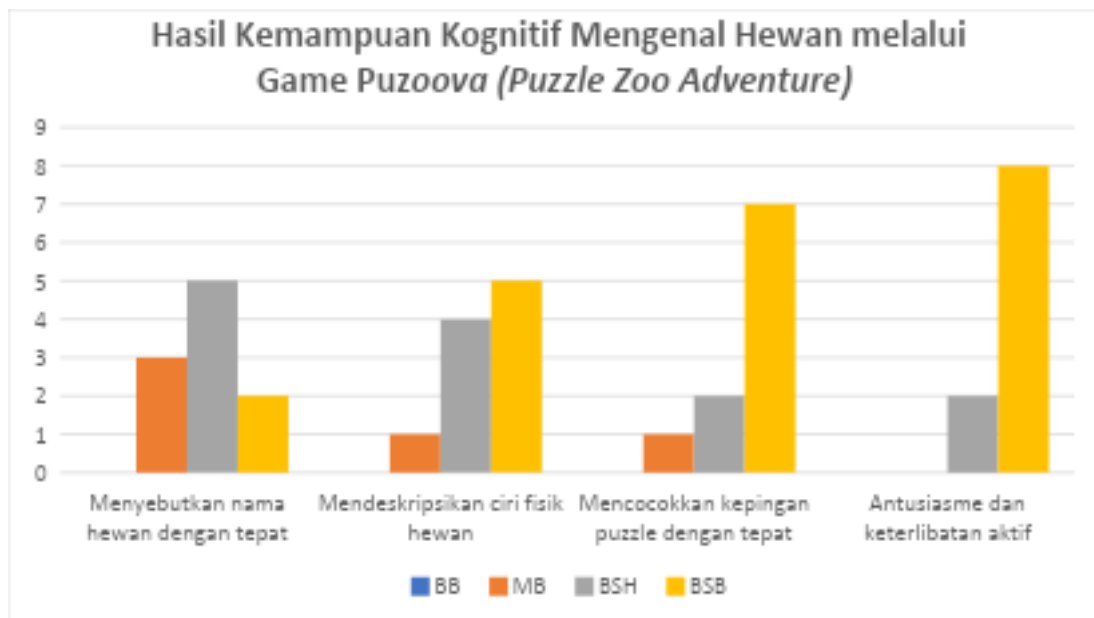
No	Observed Aspects	BB	MB	BSH	BSB
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1	Name the animals correctly	-	3	5	2
2	Describe the physical characteristics of animals	-	1	4	5
3	Match the puzzle pieces correctly	-	1	2	7
4	Enthusiasm and active involvement	-	-	2	8
5	Remembering the names of animals after the activity	-	-	1	9

Description: BB = Not Yet Developed; MB = Starting to Develop; BSH = Developing as Expected; BSB = Developing Very Well.

Based on Table 2, the use of interactive digital media Games *Puzoova (Puzzle Zoo Adventure)* showed a very positive impact on improving the cognitive abilities of early childhood children in recognizing animals. The children's memory retention indicator recorded the highest achievement, where 90% of children (9 children) managed to remember the names of animals after the activity, which was included in the Very Well Developed (BSB) category. In addition, the level of active involvement and enthusiasm of children while playing reached 80% in the BSB category. This synergy shows that real animal visualizations, presented through interactive mechanisms, were able to extend the focus span of group B children to absorb factual information optimally without getting bored quickly and remaining enthusiastic.

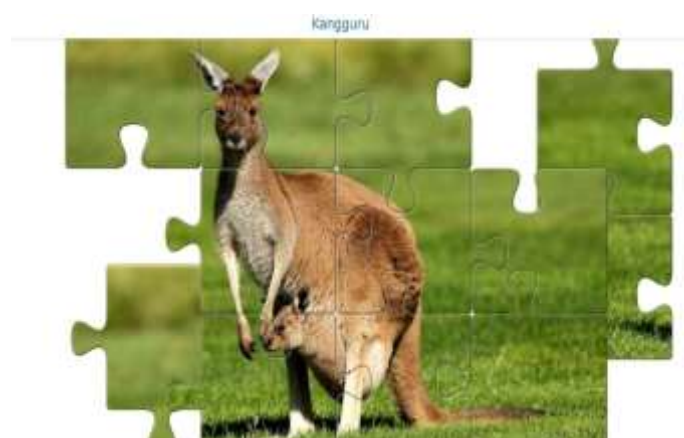
The children's success in matching puzzle pieces (70% BSB) and describing the physical characteristics of animals (50% BSB) further confirms that manipulating digital components stimulates their spatial abilities and logical reasoning. As children assemble puzzle pieces, their brains are trained to analyze cause-and-effect relationships, solve problems, and validate the visual suitability of concrete objects in the real world. The low number of children in the Beginning to Develop (MB) category and the absence of children in the Not Yet Developing (BB) category indicate that this interactive digital-based media innovation has successfully overcome the weaknesses of conventional methods that have so far been unable to trigger children's in-depth multi-sensory engagement. The results obtained support all three aspects of the empirical use of puzzles, which stimulate children's cognitive development by forcing them to solve problems from puzzle pieces to form appropriate patterns. This study is in line with the findings (Siregar and Sit 2025), which state that the use of concrete animal images is very effective in increasing children's achievement towards the minimum indicator target of 75% in the BSH or BSB categories. To further clarify this description, the following data are presented in the form of a bar chart:



Description: BB = Not Yet Developed; MB = Starting to Develop; BSH = Developing as Expected; BSB = Developing Very Well.

3.2 Discussion

The results of the study show that the PUZOOVA digital game based on Book widgets is effective in stimulating cognitive abilities to recognize animals in kindergarten B children. This finding is in line with Piaget's opinion (in Mudiono 2020) that children aged 5-6 years are in the final pre-operational stage towards concrete operations, where children learn most optimally through direct experience with concrete objects and active interaction. Digital puzzles provide this experience through real animal images that can be touched and arranged directly on the screen.



Picture 1: Cutout of a kangaroo



Figure 2: The animal puzzle has been successfully assembled by the child.



Picture 3: The pictures of animals have been arranged with the names of animals that almost all the children in the class don't know the names of.



Figure 4: is a picture of children's activities during game learning. *Puzoova*



Figure 5: is a picture of children's creativity when learning *Puzoova* games

Game Digital *Puzoova* (*Puzzle Zoo Adventure*) is an interactive digital puzzle game developed using the Book Widgets platform. Methodologically, this scientific paper
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covers three important points: 1) Visual authenticity (real animal images) that are not fictional illustrations. Most children's games use cartoon or animated illustrations that can distort children's perceptions of animals. *Puzzova* presents real animal images. *Puzzova* games can improve the cognitive abilities of group B children, helping them recognize the characteristics of living creatures accurately according to their natural forms in the wild, where teachers cannot bring live animals into the classroom. 2) Multi-Sensory Interactive Digitalization. Unlike printed books or whiteboards that are one-way, *Puzzova* games provide instant feedback in the form of real audio and animation when the puzzle pieces are placed correctly by the child. This triggers children's sensory and cognitive curiosity, so they are more comfortable in solving problems when assembling puzzles in the correct order without feeling frustrated. 3) Cognitive transition bridge. *Puzzova* games overcome the weaknesses of conventional materials that often fail to arouse children's interest and active involvement. By moving puzzle pieces in the IFP, this game trains children's hand-eye coordination and logical reasoning simultaneously through contextual play experiences.

Children's cognitive abilities increased after learning with the *Puzzova* game in line with the results of research from Azzahra et al. (2025), that there was an increase in student learning outcomes after using puzzle media, with an average score of 78% during the learning process, students were actively involved, focused, and enthusiastic when discussing and assembling puzzles related to the learning material being carried out. The results of research by Hariyanti et al. (2024) stated that there was an increase in children's cognitive abilities after playing puzzles in group B at RA Khadijah Aisyah Jakarta in 2021. The results of this study significantly provided benefits such as training problem-solving skills, improving eye-hand coordination, and recognizing the concept of shape, size, and color, as well as developing children's logical thinking skills. Educational games have an important role in supporting the cognitive development of early childhood through activities that stimulate motor skills, creativity, language, and logic while increasing children's concentration, imagination, and involvement in learning. Statistical analysis shows a significance of 0.000 (<0.05), which means there is a real effect of puzzle games on children's cognitive abilities (Aliyudin et al. 2025).

Children can access the game through digital devices such as laptops, tablets, or touchscreens (IFPs). In this game, children are presented with images of animals that have been cut into puzzle pieces. Their task is to observe the shape of the pieces and then drag them to the correct position. (*drag*) and put (*drop*). Each piece fits into the correct position to form a complete animal image. Once the puzzle is assembled, children can see the complete animal shape and recognize its name and characteristics. *Puzzova* features various types of animals, such as echidnas, porcupines, sun bears, kangaroos, and pangolins. This activity trains children to observe, match shapes, solve simple problems, and remember the characteristics and traits of these animals.

The learning process is interactive because children are directly involved in assembling the puzzle and receive feedback from the system. Once the puzzle is completed, a message appears that says "Good Job," providing a fun learning experience. Children feel challenged to complete the puzzle faster than their friends. *Puzzova* Digital Games not only helps improve the ability to recognize animals and stimulates cognitive abilities, concentration, eye and hand coordination, and logical thinking skills in PAUD children.

Children's high enthusiasm during digital problem-solving activities is examined through the lens of play theory. The development of digital education infrastructure in educational institutions has placed digital educational games at the center of educational progress (Li, Chen, and Id 2024). Play focuses on activities children undertake

voluntarily to gain satisfaction and enjoyment without external pressure. When learning instructions are adaptively designed into an interactive game format, children's intrinsic motivation to explore challenges will emerge naturally. The use of interactive digital platforms such as *Book Widgets* or educational puzzle games has proven successful in blurring the rigid boundaries between learning and playing. Through fun game mechanics (*playful learning*) but still full of educational value, children do not feel burdened by formal academic targets, but rather are actively participating in solving problems with deep focus and concentration. This is in line with the results of research by Zulkarnain and Nirwana (2025), who explained that interactive elements (color, moving visuals, audio success responses) in digital puzzles strengthen active participation and perceptions of children's involvement so that their learning motivation increases rapidly compared to regular print media.

The use of IFP technology provides significant additional advantages in supporting children's early learning process through digital manipulation; children can directly touch, slide, and match puzzles using their finger coordination. This activity improves children's work methods simultaneously, especially through improving eye-hand coordination and the flexibility of small muscles in the child's wrists. At the same time, this multi-sensory stimulation triggers the strengthening of the cognitive capacity of group B children in identifying, processing, and reasoning concrete visual forms. The findings of Razali et al. (2018) which state that children's activities such as *scrolling* And *swiping* above the touch layer correlates significantly with the early achievement of children's fine motor skills (muscles and wrists in children, The findings of Apriyatama et al. (2026) state that large buttons and drag-drop objects in puzzle games on the touch screen are designed to facilitate the physical limitations of early childhood to design and facilitate children's visual cognitive acuity.

A diverse selection of animals in the game *Puzoova*, including animals not always familiar to children, such as echidnas and pangolins, has been shown to broaden children's cognitive horizons. After completing the puzzle, children are able to name and describe the physical characteristics of the animals. This reflects the processes of assimilation and accommodation within children's cognitive structures, as described in Piaget's theory of cognitive development. Children's knowledge schemas about animals expand through meaningful puzzle play experiences.

This research as a whole strengthens the position of interactive *Puzoova* digital games Platform-based games such as Book widgets are relevant and innovative learning games for PAUD in the digital era, and their use still requires optimal teacher guidance and facilitation so that the cognitive stimulation process takes place in a directed and meaningful manner.

4. CONCLUSION

Based on the results of the research and discussion, we can conclude that digital puzzle *Puzoova* games. The use of Book widgets is highly effective in stimulating the cognitive abilities of 5-6-year-old Kindergarten B children in recognizing animals. Interactively, children assemble a jigsaw puzzle of five types of animals: an echidna, a hedgehog, a sun bear, a kangaroo, and a pangolin using an IFP board on a touchscreen. During this process, they show improvement in naming animals, describing their physical characteristics, and demonstrate high enthusiasm and engagement in the learning process.

Book widgets, a platform for creating digital puzzles, makes it easier for teachers to create engaging and interactive learning games. This study recommends that early childhood education teachers further explore Book widgets' various features as an alternative,

innovative learning game that can support the stimulation of all aspects of early childhood development.

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