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Utilizing the *Lotto Wabena* Game to Foster Cognitive Development in Young Children

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ABSTRACT

Background of the study: This research is motivated by the lack of variety in the use of educational games as engaging learning media for early childhood. Conventional methods are still widely used and often fail to optimally support cognitive development in young learners. Therefore, it is necessary to introduce innovative game-based tools that can enhance children's thinking abilities in a playful and developmentally appropriate way. One such tool is the *Lotto Wabena* game, designed to stimulate children's memory, attention, categorization, and logical reasoning.
Aims and scope of paper: The aim of this study is to develop the *Lotto Wabena* game as a learning medium to improve cognitive development in children aged 5–6 years. The research is limited to learners at Al Husnayaini Kindergarten, Kubang Raya District, Pekanbaru, and focuses on the tool's feasibility, quality, and effectiveness.
Methods: This is a research and development (R&D) study using the Borg and Gall model. Data were collected through observation, interviews, documentation, and questionnaires. Validation was conducted by content and media experts. The data, mainly qualitative, were analyzed using assessment criteria to evaluate the developed game.
Results: Material expert validation showed a score of 87.5% (very feasible), while media expert validation reached 91.62%. Cognitive improvement was evident, with pre-test scores averaging 46.63% and post-test scores reaching 91.35%. A small group trial yielded a score of 94.28%, indicating a strong positive impact on cognitive development.
Contribution: This study provides a validated, effective game-based learning tool that supports cognitive growth in early childhood and offers practical implications for educators and curriculum developers.

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INTRODUCTION

Current cognitive development among children in Indonesia remains relatively low. This is supported by the World Population Review (October 2022), which published global intelligence quotient (IQ) rankings. According to the data, Indonesians have an average IQ of 78.49, ranking 130th out of 199 countries. In contrast, Japan holds the highest IQ average (106.48), while Nepal ranks lowest (42.99). Based on the Stanford-Binet classification, Indonesia's average IQ falls under the "borderline" category, indicating the presence of intellectual potential but also the likelihood of delayed learning processes.

In addition to IQ, the 2018 Programme for International Student Assessment (PISA) results show low academic performance among Indonesian students, with scores of 371 in reading, 379 in mathematics, and 396 in science, averaging 382. This places Indonesia at 71st out of 77 countries. Furthermore, the 2017 Intelligence Capital Index (ICI), which assesses a country's capacity to generate innovative economic ideas, ranked Indonesia 89th out of 128 countries (Horvath & Fabricant, 2025).

The *Lotto Wabena* game developed in this study adopts a structured approach by integrating three core elements: colors, shapes, and numbers. The game is designed to stimulate children's cognitive processes, from visual matching to logical pattern recognition—key aspects of symbolic thinking development. Unlike conventional games that focus solely on entertainment, *Lotto Wabena* offers a gradual, comprehensive learning experience aligned with early childhood cognitive development theories, particularly Bruner's. Its novelty lies in the systematic integration of visual (color), categorical (shape), and logical (number) elements, with adjustable difficulty levels suited to children's age and developmental stages.

The urgency of stimulating cognitive development is evident in these national and international assessments. In early childhood, cognitive development includes five foundational areas: shape, color, size, sorting, and grouping (Aisyah, 2020; Amalia & Khoiriyati, 2018; Beamish et al., 2025; Di & Wang, 2025; Reuter-Lorenz & Park, 2024). The cognitive growth and environmental factors, beginning from early human maturity (Schunk & DiBenedetto, 2023). Cognitive development allows children to think, remember, and creatively solve problems. It involves connecting events, evaluating situations, and producing solutions (Zakharin & Bates, 2025).

Engaging learning activities are essential to improve cognitive abilities. The more enjoyable the activity, the more significant the impact on children's learning and understanding (Aisyah, 2020; Yang et al., 2024). Cognitive ability involves mental processes that gain knowledge through experience, regulated by internalized concepts and expressed through ideas and symbols (Doukani et al., 2021). Cognitive growth directly affects learning success, as most learning requires thinking and memory (Doukani et al., 2021).

Psychologists believe that cognitive development starts at birth. It evolves with physical and neurological growth (Beamish et al., 2025). However, cognitive growth varies among children and is shaped by several factors—particularly a stimulating learning environment that includes books, educational games, and positive interactions (Afsari et al., 2022). These factors support children in recognizing early science and math concepts and developing logical, explanatory, and problem-solving skills (Zakharin & Bates, 2025).

In early childhood, cognitive ability manifests through strategies for problem-solving, artistic expression, and information recall (Arlina et al., 2024). These abilities reflect changes in children's thinking, intelligence, and language use (Fitri et al., 2024). Therefore, learning activities should prioritize cognitive structure development through direct and meaningful experiences (Fardiah et al., 2019). Teachers should also understand stages of cognitive development and provide content, methods, and media suited to children's needs (Fitri et al., 2024).

The main step to improving cognitive development is through an education system that emphasizes play-based learning. Educational game tools help children concentrate and engage actively. These tools support children's intelligence and personality development. Harlock also

notes that young children have a short attention span (10–15 minutes), and therefore need engaging media to prevent boredom (Chiu et al., 2024).

However, observations at Al Husnayaini Kindergarten, Pekanbaru, revealed that children aged 5–6 are not developing symbolic thinking as expected. Learning activities rely heavily on textbooks and whiteboard instruction. Limited resources and unengaging materials lead to inattention, boredom, and low retention. Therefore, this research introduces the *Lotto Wabena* game to stimulate cognitive skills effectively.

Lotto game tools serve as visual media to teach children to compare and identify shapes, colors, numbers, and images. They are known as instructional games that use sound and visuals, requiring children to concentrate using multiple senses (Otten et al., 2025). Traditional lottery games focus on either color, shape, or number, but the *Lotto Wabena* integrates all three in a single tool. This integration makes learning more efficient, fun, and developmentally supportive—especially for cognitive growth.

METHOD

Research Design

This study on the development of the *Lotto Wabena* educational game to enhance the cognitive abilities of early childhood learners at Al-Husnayaini Kindergarten, Kubang Raya District, Riau, adopts a Research and Development (R&D) design. Specifically, it applies the Borg and Gall development model, which is widely used in educational product development (Putri et al., 2023). R&D is a research approach aimed at developing a product and testing its effectiveness and feasibility. In this study, the researcher focuses on the third level of R&D, which involves researching and testing the product to improve and refine it. The ultimate goal is to create a learning tool that is more practical, attractive, beneficial, and functional for early childhood education (Putri et al., 2023).

Research Subjects

The subjects of this study are children aged 5–6 years enrolled in ECE (Early Childhood Education) Al-Husnayaini. This age group is considered ideal for cognitive development interventions, particularly in symbolic thinking, pattern recognition, and logical reasoning, which the *Lotto Wabena* game aims to stimulate.

Data Collection Techniques

The data collection techniques used in this study included observation, interviews, questionnaires, and documentation. Observation was carried out to monitor children's behaviors and responses during the learning activities involving the *Lotto Wabena* game. Interviews were conducted with teachers and school staff to obtain deeper contextual insights related to the implementation and impact of the game tool. Questionnaires were distributed to assess users' perceptions and responses, particularly focusing on the tool’s effectiveness, attractiveness, and usability. In addition, documentation was employed to record the stages of development and implementation of the product. To ensure the validity and relevance of the data collected, all research instruments were validated by both material experts and media experts, with particular attention to content accuracy and developmental appropriateness for early childhood learners.

Data Analysis Techniques

The data were analyzed using both qualitative and quantitative methods. Qualitative data, such as observations and interview results, were analyzed thematically to identify patterns and effectiveness in children's cognitive responses. Quantitative data from questionnaires and expert validations were analyzed using descriptive statistical techniques, such as percentage calculations, to determine the feasibility and effectiveness of the *Lotto Wabena* game tool. The results were then interpreted based on predetermined criteria of success.

Data Validation Techniques
To ensure data validity, this study employed several validation strategies. Validation of the product was carried out by two media experts and a content (material) expert, who assessed the game tool based on criteria such as feasibility, attractiveness, instructional value, and usability. Triangulation of data sources—through observations, interviews, and documentation—was also used to enhance the credibility and reliability of the findings.

RESULTS

Potential and Problems
This study holds significant potential, particularly in how educational game tools can enhance children's interest and engagement in the learning process, thereby helping them achieve learning objectives in a fun and stimulating manner. However, a key issue observed in the field is the limited availability of educational game-based media that provide substantial benefits to students' development. Based on this potential and the existing problems, the researchers were motivated to develop an educational game media product—*Lotto Wabena*, which integrates color, shape, and number recognition.

Information Collection
Observations and interviews conducted at Al-Husnayaini Kindergarten, Kubang Raya District, Pekanbaru, revealed the absence of lottery-based educational media in the learning environment. To support the development process, data were gathered through classroom observations and literature reviews, aiming to identify theoretical foundations regarding the use of lottery games in supporting the cognitive development of children aged 5–6 years. Additional data on existing lottery games were also collected from internet sources, including comparisons with lottery designs used in previous research. An example of a lottery game found online is shown in the following figure 1.

Figure 1. Types of Lotto Games

Source: https://madaniah.co.id/product/educational-teaching-aids-color-lotto/

Product Design
The educational media product developed in this study is an innovation of the traditional lottery game, redesigned to serve as a cognitive development tool for early childhood. The *Lotto Wabena* game was modified creatively by combining three types of lotteries—color, shape, and number—and introducing elements of challenge to stimulate various aspects of cognitive skills. Based on the results of a needs analysis, the final design includes diverse colors, geometric shapes, and numbers from 1 to 10, presented on a lotto board measuring 46 cm in length and 22 cm in height.

Design Validation
Once the initial prototype of the *Lotto Wabena* game media was developed, it underwent a validation process involving one content (material) expert and two media experts. The validation

was conducted in two stages—before and after revisions were made—to improve the quality of the educational product. The validation aimed to assess the accuracy, feasibility, and appropriateness of the material and media components.

Material Expert Validation

During the validation stage, the product content was reviewed by two material experts, including initial Mrs. UVS. The results of the expert assessment are presented in the following table 1.

Table 1. Results of Material Expert Validation Assessment

Assessment Indicators	Material	Score	Average	Presentation
	The Wabena Lotto game is accurately presented according to the learning material	4		
	The Wabena Lotto game aligns with the intended learning objectives	3		
	The Wabena Lotto game is presented in an engaging and attractive manner	3		
	The rules of the Wabena Lotto game are clearly explained	4		
	The steps provided are appropriate to the child's developmental level	3		
	The Wabena Lotto game is aligned with the Early Childhood Achievement Standards	4		
	Developmental aspects are integrated into the game tools	4		
	The assessment is consistent with the evaluated aspects	3		
	The game content does not cause misunderstandings	3		
	The game fosters critical thinking in children	4		
	Total Score	35	3.5	87,5%
	Average Score	3.5	3.5	87,5%
	conclusion		Very feasible	

Based on the results presented in Table 1, the material aspect of the *Lotto Wabena* game was deemed highly feasible, achieving a feasibility score of 87.5%. The total score obtained was 35 out of 40, based on 10 assessment indicators, placing it in the "very feasible" category.

Media Expert Validation

During the validation process, the product was assessed by two media experts: initial Mrs. RF and Mrs. FR. The outcomes of their evaluation are summarized in the table 2. Based on Table 2, the appearance aspect of the *Lotto Wabena* game received a feasibility score of 100%, while the design aspect achieved 93.75%, and the learning aspect also attained 100%. The overall score totaled 42 points across 11 assessment indicators, resulting in an average feasibility percentage of 97.91%, which falls under the "very feasible" category.

Based on Table 3, the evaluation results show that the appearance aspect of the *Lotto Wabena* game achieved a feasibility percentage of 100%. The design aspect received a score of 87.5%, while the learning aspect also attained a full 100%. Overall, the total score was 39 out of 11 assessment indicators, resulting in a feasibility percentage of 95.83%, which falls under the "very feasible" category.

Table 2. Assessment Results from Media Expert Validator Mrs. RF

Assessment Indicators	Aspect	Score	Average	Percentage
Appearance	Attractive visual presentation	4	4	100%
Design	Appropriate sizing of materials	3	3.75	93.75%
	Color combinations suitable for children aged 5–6 years	4		
	Appealing game design	3		
	Game design aligned with cognitive development	4		
	Developmentally appropriate challenges included	4		

Table 2. Assessment Results from Media Expert Validator Mrs. FR

Assessment Indicators	Aspect	Score	Average	Feasibility (%)
Appearance	Attractive appearance	3	3	100%
Design	Appropriate size used	3	3.5	87.5%
	Color combinations suitable for children aged 5–6 years	4		
	Appealing game design	3		
	Relevance of the game to children's cognitive development	4		
	Presence of engaging challenges suitable for cognitive development	4		
	Durability of *Lotto Wabena* game materials	3		
	Safety of materials used	4		
	Practicality of educational play tools (easy to store and transport)	3		
Learning	Compatibility of game media with children's cognitive abilities	4	4	100%
	Internal consistency of media in developing cognitive skills (e.g., symbolic thinking, critical thinking)	4		

Design Improvements

Several revisions and improvements were made based on expert feedback and suggestions to optimize the final product.

Content Expert Feedback

Revisions from the content expert focused on enhancing the quality and relevance of the material in the *Lotto Wabena* game. Initial Mrs. UVS, recommended the inclusion of 5–6 recent journal references (published within the last five years) that are relevant to the discussion of Lotto-based educational games. She also suggested adding references to previous research linked to *Lotto* games within the *Wabena Lotto* discussion, incorporating a section on the identification of educational game tools at the beginning of the chapter, and including images of *Lotto* games before and after development.

Media Expert Feedback

Media-related revisions were provided by initial Mrs. RF, and Mrs. FR. Initial Mrs. R suggested tidying up the layout of the lottery cards, adding several card variations as alternatives and enhancements, and incorporating geometric shapes into the game board design. Initial Mrs. F noted that the *Wabena Lotto* game tool is sufficiently appropriate for early childhood learning but recommended further development for better durability and visual appeal. Her suggestions included replacing the cardboard with colored plywood and substituting the flannel cloth with printed, colorful designs. She also advised using laminated prints for the question cards to enhance usability.

Product Trial

The product trial was conducted at Al Husnayaini Kindergarten, located in Kubang Raya District, Pekanbaru. The trial involved one class consisting of 13 students selected from a total population of 26, with varied cognitive abilities. The trial employed questionnaires to assess various components of the *Lotto Wabena* game, including its appearance, content, and materials. Additionally, a small group trial was conducted with five children, during which the instrument was administered with the assistance of the researcher.

Table 4. Pre-Test Results of the Product Trial

No	Child's Name	Score	Average	Percentage
1	ANA	6	1.50	37.5%
2	ASA	7	1.75	43.75%
3	AVR	8	2.00	50%
4	CPI	9	2.25	56.25%
5	DA	7	1.75	43.75%
6	KHA	8	2.00	50%
7	MLA	9	2.25	56.25%
8	MNA	7	1.75	43.75%
9	MHA	7	1.75	43.75%
10	RAK	6	1.50	37.5%
11	SNA	8	2.00	50%
12	VRH	8	2.00	50%
13	NN	7	1.75	43.75%
	Total	97	24.25	606.25%
	Average	7.46	1.86	46.63%

Based on Table 4, it can be seen that the results of the pre-test in the product trial indicate that the children's cognitive development is at the "Starting to Develop" stage. This is reflected in the pre-test percentage score of 46.63%, which falls within the corresponding developmental criteria.

Table 5. Post-Test Results of the Product Trial

No	Child's Name	Score	Average	Percentage
1	ANA	14	3.50	87.5%
2	ASA	14	3.50	87.5%
3	AVR	15	3.75	93.75%
4	CPI	15	3.75	93.75%
5	DA	15	3.75	93.75%
6	KHA	15	3.75	93.75%
7	MLA	15	3.75	93.75%
8	MNA	15	3.75	93.75%
9	MHA	15	3.75	93.75%
10	RAK	14	3.50	87.5%
11	SNA	14	3.50	87.5%
12	VRH	15	3.75	93.75%
13	NN	14	3.50	87.5%
	Total	190	47.5	1,187.5%
	Average	14.61	3.65	91.34%

According to Table 5, the post-test results demonstrate a significant enhancement in children's cognitive abilities, with an achievement rate of 91.35%, classified under the criterion of "Developing Very Well." This indicates that the educational game tool, *Lotto Wabena*, has been effective in stimulating and improving children's cognitive development, as evidenced by the high level of achievement demonstrated by the participants after the implementation of the learning intervention.

Table 6. Comparison of Pre-Test and Post-Test Results

Product	Pre-Test	Post-Test	Improvement
Development of the *Lotto Wabena* Educational Game to Enhance Early Childhood Cognitive Abilities at ECE Al Husnayaini, Kubang Raya District, Pekanbaru City	46.63%	91.35%	69%

Referring to Table 5, a notable increase in outcomes was observed after the intervention. The pre-test percentage stood at 46.63%, while the post-test percentage rose substantially to 91.35%, indicating a total improvement of 69%. This significant growth reflects the positive impact of the Lotto Wabena educational game in enhancing children's cognitive abilities, suggesting that the intervention was both appropriate and effective in achieving its developmental goals.

Table 6. Results of the Small Group Trial

No	Name	Elements of the Question Assessed (1–7)	Score
1	ANA	1, 1, 1, 1, 1, 1, 0	6
2	ASA	1, 1, 1, 1, 0, 1, 1	6
3	CPI	1, 1, 1, 1, 1, 1, 1	7
4	MNA	1, 1, 1, 1, 1, 1, 1	7
5	RAK	1, 1, 1, 1, 1, 1, 1	7

Guttman Scale Interpretation:
1 = Agree
0 = Disagree
Description of the Assessed Elements:
Use of attractive colors
Visual appeal of the form or design
Overall attractiveness of the Wabena Lotto game tool
Clarity of the writing on the challenge sheets in the Wabena Lotto game
Ease of answering or completing the challenges provided
Ease of understanding the game rules
Ease of matching the lotto pieces on the Wabena board

Small Group Trial Results and Product Assessment
Based on Table 4.9, the assessment results from the small group trial of the Wabena Lotto game show a total score of 33 out of a maximum of 35, which corresponds to a percentage of 94.28%. These findings indicate that the Wabena Lotto game tool falls into the “Very Good” category and meets the “Highly Feasible” criteria for use in early childhood education.

Final Product Revision
Revisions to the product were made based on research findings, observation data, children's response questionnaires, and feedback from teachers regarding any identified weaknesses or shortcomings in the Wabena Lotto game. The goal of these revisions was to enhance the overall quality and effectiveness of the product. Following evaluations conducted by the principal and teachers at Al Husnayaini Kindergarten, Kubang Raya District, Pekanbaru, several constructive suggestions were provided. One key recommendation was to improve the visual design by incorporating more visually appealing and vibrant colors, which was then implemented in the revised version of the game.

DISCUSSION

The discussion of this research is based on a comparative analysis of the pre-test and post-test scores conducted in Class B, which involved 13 children selected from a total population of 27 at Al Husnayaini Kindergarten, Kubang Raya District, Pekanbaru. The aim of this analysis was to

determine whether the implementation of the *Lotto Wabena* educational game had a measurable impact on improving children's cognitive development.

After administering the pre-test and post-test, the data showed a significant increase in cognitive performance. The *Lotto Wabena* game was tested twice with the children. The first finding, derived from the pre-test, revealed that many children's cognitive skills were not yet optimal. The average pre-test score was 46.63%, categorized as "Starting to Develop." The highest scoring indicator was "children are able to understand the rules of the game," indicating that the children were enthusiastic about participating in learning activities using the *Lotto Wabena* game. Conversely, the lowest scores were in the indicators "children are able to group objects based on color and shape" and "children are able to recognize geometric shapes." This was attributed to children's confusion and limited familiarity with geometric forms they had not previously encountered.

The post-test results demonstrated a substantial improvement, with a percentage increase to 91.35%, placing it in the "Developing Very Well" category. These results confirm that the *Lotto Wabena* game serves as an effective educational tool to enhance cognitive skills in early childhood. The improvement was observed across multiple cognitive indicators. The first was the ability to classify and distinguish Lotto pieces by color, shape, and number—consistent. The theory that Lotto games can enhance children's observational skills, attention span, and cognitive abilities (Dziubiński, 2013; Grote & Matheson, 2006, 2006; Gulley & Scott, 1993; Hart, 2008, 2016; Kovenock & Roberson, 2021; Mizerski & Mizerski, 2001; Paarporn et al., 2025). The Lotto games positively impact children's number recognition, curiosity, and learning motivation (Mizerski & Mizerski, 2001). Another improvement was observed in the indicator "children pay attention and listen when the teacher explains the rules of the game," attributed to the engaging and enjoyable nature of the learning activity.

The third finding was the increase in children's ability to follow instructions and game rules. This process supported the development of self-regulation, concentration, and problem-solving skills, as well as self-confidence when successfully completing tasks. This is in line with metacognitive theory as proposed by Anggraeni, which emphasizes the importance of self-monitoring in cognitive functioning (Anggraini et al., 2018).

The fourth indicator that showed improvement was children's ability to respond to questions or challenges, reflecting growth in problem-solving skills, logical reasoning, and critical thinking. This development indicates that stimulating children's intelligence not only enhances their cognitive abilities but also increases their engagement in classroom activities (’Aziz & Aditya Hidayah, 2024; Calma & Davies, 2025; Cananau et al., 2025; Gerlich, 2025; Leibovitch et al., 2025; Stenseth et al., 2025).

A fifth observation noted that children experienced joy and excitement while engaging with the game, especially when rewards were involved. Their visible happiness—expressed through laughter, smiles, and enthusiastic body movements—indicates emotional satisfaction. This finding aligns with Hurlock's theory that happiness is a pleasurable emotional state often manifested through smiling and laughter (Hurlock, 1980).

The sixth finding revealed a logistical challenge: a shortage of teaching staff to manage children's eagerness and ensure orderly play. Due to their high enthusiasm, some children struggled to wait for their turn and would leave their seats prematurely. This issue was addressed by incorporating ice-breaking activities to recapture their attention.

Based on these findings, the final comparison between the pre-test and post-test showed a 69% improvement in children's cognitive development. The small group trial also yielded a high performance result of 94.28%, reinforcing the effectiveness of the *Lotto Wabena* game. This supports the theory of Dewi who argue that Lotto games help children develop thinking and learning abilities related to colors and shapes (Dewi, 2017). Additional validation came from interviews with teachers and the school principal at Al Husnayaini Kindergarten, who observed a clear positive impact of the *Lotto Wabena* game on children's cognitive development and learning engagement.

Overall, the study underscores the importance of using educational games as instructional media to support child development, particularly in the cognitive domain. The appropriate use of such media not only enhances focus, memory, and critical thinking but also boosts motivation and enjoyment in learning. Compared with previous studies, the *Lotto Wabena* game has proven effective in fostering children's ability to follow instructions, distinguish shapes and numbers, solve problems, and stay engaged in lessons. This tool combines educational value with entertainment, creating a dynamic and meaningful learning environment.

Implications

The findings of this study have important implications for early childhood education, particularly in the selection and utilization of instructional media. The *Lotto Wabena* educational game proved effective in enhancing children's cognitive development, suggesting that integrating play-based learning tools into classroom practice can significantly improve learning outcomes. Educators can adopt similar game-based approaches to foster children's abilities in classification, problem-solving, logical reasoning, and attention span in a fun and engaging way. Moreover, the study demonstrates that cognitive development in early childhood can be accelerated through structured and interactive learning activities.

Research Contribution

This research contributes to the growing body of knowledge on early childhood education by providing empirical evidence on the effectiveness of the *Lotto Wabena* game as a cognitive development tool. It offers a practical model for educators to develop educational games that are aligned with cognitive learning objectives, particularly for children aged 5–6. The study also bridges theoretical perspectives on cognitive development—such as metacognitive theory, problem-solving, and emotional engagement—with practical classroom implementation, thereby supporting a more holistic approach to learning in early childhood.

Limitations

While the findings are promising, this study has several limitations. First, the sample size was relatively small (13 children), and limited to a single institution—Al Husnayaini Kindergarten in Kubang Raya District, Pekanbaru—therefore, the generalizability of the results is limited. Second, the game only included numbers 1–10, which constrained the depth of numerical understanding that could be assessed. Additionally, the study observed challenges in classroom management due to the children’s high enthusiasm and the limited number of teachers available to supervise gameplay, which may have influenced the learning atmosphere.

Suggestions

Future research could involve a larger and more diverse sample across different early childhood education institutions to validate and strengthen the generalizability of these findings. The *Lotto Wabena* game should also be developed further by expanding its content (e.g., including more numbers, shapes, or levels of difficulty) to accommodate a wider range of cognitive abilities. Training programs for teachers on how to effectively facilitate educational games in the classroom are also recommended. Finally, integrating digital or multimedia elements into the *Lotto Wabena* game could increase interactivity and appeal, while also providing opportunities for individualized learning.

CONCLUSION

Based on the results of this development research, an educational game product titled Lotto Wabena was successfully developed to support early childhood learning. The outcomes of the product development process demonstrated that the *Lotto Wabena* game effectively stimulates cognitive development in young children. According to evaluations conducted by both material

and media experts, the game was deemed suitable for enhancing the cognitive abilities of children aged 5–6 years. Specifically, the material expert provided a feasibility score of 87.5%, while the media expert validator assessed it at 96.87%. These scores indicate that the *Lotto Wabena* game is highly appropriate for use in early childhood education. The cognitive development observed among children in Group B (ages 5–6) showed meaningful progress, as evidenced by their ability to recognize and differentiate Lotto elements such as colors, numbers, and geometric shapes. Furthermore, the children were able to respond to the tasks provided and follow instructions accurately, demonstrating growing cognitive competence.

AUTHOR CONTRIBUTION STATEMENT

RA conceived the idea. H and YN conducted data collection. W and SSS contributed to the literature review. WM and YI contributed to proofreading and drafting the manuscript. All authors reviewed and approved the final version of the manuscript.

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