

Improving The Ability To Distinguish Letter Shape Through An Interactive Game Based On A Digital Word Wall In Group A At Al-Azkiya Paud

Ayu Gading Suryani¹, M. Arzani², Eliyana³

¹²³Program Studi Pendidikan Anak Usia Dini, STKIP Hamzar

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Abstract

This study aims to improve the ability to differentiate letter shapes in group A children at PAUD KB Al-Azkiya through the application of digital interactive Wordwall games. This research was motivated by the low ability of children to differentiate letters with similar shapes, such as letters b and d, as well as p and q. The conventional approaches previously used were deemed ineffective in attracting children's interest and focus. Therefore, an innovative, interactive media suitable for early childhood learning characteristics is needed. This research was conducted at PAUD KB Al-Azkiya Singgar Penjalin in group A in the second semester of the 2025/2026 academic year with a total of 10 children as subjects. This study is a Classroom Action Research (CAR) conducted in two cycles. Each cycle consisted of planning, action, observation, and reflection stages. Data on the ability to differentiate letter shapes were collected through observation sheets and performance tests, while supporting data were obtained through interviews and documentation. The collected data were analyzed quantitatively and qualitatively. The results of this study are: (1) There is an improvement in the ability to differentiate letter shapes in group A children after the application of digital interactive Wordwall games in cycle I, with classical completeness reaching 60% (6 out of 10 children achieved completeness) and an average achievement percentage of 74.7%. (2) There is a more significant improvement in the ability to differentiate letter shapes in cycle II, with classical completeness reaching 80% (8 out of 10 children achieved completeness) and an average achievement percentage of 81.9%. (3) The improvement in children's ability to differentiate letter shapes occurred consistently based on the achievement percentage from pre-cycle (46.25%), cycle I (74.7%), to cycle II (81.9%), thus in cycle II it has achieved the established success indicator of $\geq 80\%$. The use of directed digital media, designed according to children's cognitive levels, is able to provide a meaningful learning experience and intrinsically motivate children. These findings imply that digital game-based media such as Wordwall can serve as a practical, replicable strategy for early childhood teachers seeking to remediate specific letter-confusion difficulties within a limited number of action-research cycles.

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Corresponding Author:

Ayu Gading Suryani

STKIP Hamzar

Email: ayugading991@gmail.com

1. INTRODUCTION

Early childhood education (PAUD) is a comprehensive process of growth and development for children aged birth to six years, encompassing all physical and non-physical aspects, by providing stimulation for appropriate physical, spiritual, motor, intellectual, emotional, and social development (Dian, 2021). Early childhood is often referred to as the golden age, when a child's brain is highly sensitive to various stimuli from its environment (Amin, 2021; Helmawati, 2022).

Therefore, it is crucial to provide appropriate and optimal educational stimulation to ensure children are prepared for further basic education. One crucial aspect of early childhood development is language development and early literacy, which includes the ability to recognize and differentiate letter shapes (Nesi et al., 2021).

Recognizing letters is not easy for young children. Many children struggle to visually distinguish letters that have similar shapes, such as 'b' and 'd', 'p' and 'q', and 'm' and 'n' (Yeni, 2020). The ability to distinguish letter shapes (visual letter discrimination) is a crucial early stage before children enter the early stages of reading and writing. Difficulties in visual discrimination can have a long-term impact on children's future literacy skills if not addressed promptly through appropriate stimulation (Rahmawati, 2021). This ability goes beyond memorizing shapes; it also involves analyzing lower-level visual features, such as distinguishing the orientation of lines and curves in a symbol (Lally, 2023).

Based on pre-cycle observations at the Al-Azkiya Singgar Penjalin Preschool and Kindergarten in Group A, it was found that children's letter-shaping abilities were still very low. Of the 10 children observed, most often confused similar letters when naming and pointing to them. This low ability was triggered by a less varied and teacher-centered learning approach. Letter recognition learning was still conventional, using whiteboards and printed letter cards, as well as monotonous lecture methods. Children who are in the concrete thinking stage and have short attention spans become bored quickly, lack focus, and are not actively involved in the learning process (Marzoan & Arzani, 2020; Sutrisno et al., 2021).

To address these issues, innovative learning media are needed that are interactive, engaging, and appropriate to the learning characteristics of early childhood, which are synonymous with play. One solution relevant to the current digital era is the use of interactive, educational games (Fidya, 2021; Van Dijk, 2020). Wordwall is a website-based application platform specifically designed to create a variety of visually engaging quizzes and interactive games (Sandy, 2021). Through Wordwall, teachers can create playful learning activities, such as letter matching, shape grouping, and visual quizzes packaged in interactive animations (Nursarofah et al., 2024; Pramesti et al., 2025).

Several previous studies have shown that the use of digital educational games, including Wordwall, has a significant impact on improving children's cognitive and language skills. Pratiwi's (2023) research proved that Wordwall games effectively improve children's vowel recognition skills. Similarly, Septianti's (2025) research found a drastic increase in the motivation and literacy learning outcomes of 5-6-year-old children after intervention with Wordwall media. Jackson et al. (2025) also confirmed that interactive word walls are very influential in improving students' vocabulary mastery and visual discrimination. Unlike previous studies that generally focus on general letter recognition, this study focuses on solving a specific problem, namely the difficulty in distinguishing similar letter shapes (b-d, p-q, m-n) in 4-5-year-old children (Group A) (Adilla & Salimi, 2025; Ningsih & Arzani, 2023). Therefore, this study aims to describe the process and results of improving letter shape differentiation skills through the implementation of digital interactive Wordwall games at the Al-Azkiya Preschool.

More specifically, while Pratiwi (2023), Septianti (2025), and Jackson et al. (2025) have demonstrated the general benefits of Wordwall for vowel recognition, literacy motivation, and vocabulary mastery, none of these studies specifically targeted children's persistent confusion between visually similar letter pairs (b-d, p-q, m-n), nor did they document the incremental, cycle-by-cycle instructional adjustments needed to resolve this specific difficulty. Most prior Classroom Action Research on early literacy media also reports only a single round of intervention, leaving it unclear how the intervention should be refined when initial results fall short of the success target. This gap justifies the need for a two-cycle CAR design that not only measures overall improvement but also documents the specific strategy adjustments between cycles that lead children from persistent letter confusion to accurate visual discrimination.

2. RESEARCH METHOD

This study uses qualitative and quantitative approaches in the Classroom Action Research (CAR) design. According to Salahudin (2022) and Nigrum (2021), CAR is a reflective and collaborative research approach to improve and enhance the quality of classroom learning. The CAR model used refers to the Kemmis & McTaggart spiral model, which consists of four main stages in each cycle: (1) planning, (2) action, (3) observation, and (4) reflection.

In each cycle, the four stages were operationalized as follows. The planning stage involved preparing the Daily Learning Implementation Plan (RPPH), setting up the specific Wordwall game template for the theme, and preparing the observation sheets and performance test to be used at the end of the cycle. The action stage involved the teacher implementing the planned Wordwall-based activities directly in the classroom over several meetings. The observation stage was conducted concurrently with the action stage, in which the researcher and the class teacher jointly recorded children's responses, engagement, and difficulties using the observation guidelines, while also administering the letter-matching performance test at the end of the cycle. The reflection stage involved the researcher and class teacher collaboratively reviewing the observation and test results against the $\geq 80\%$ success indicator; if the target was not met, specific obstacles were identified and translated into concrete strategy adjustments to be implemented in the planning stage of the following cycle.

This research was conducted at the Al-Azkiya Early Childhood Education (PAUD KB) in Penjalin Hamlet, Singgar Penjalin Village, Tanjung District, North Lombok Regency, during the even semester (May - June) of the 2025/2026 academic year. The subjects were 10 children from Group A aged 4-5 years. The selection of these subjects was based on the findings of initial observation problems, where the children experienced significant difficulties in visually discriminating letters.

Data collection techniques were carried out comprehensively (Muhadjir, 2020) through participatory observation, performance tests (naming and matching letters), in-depth interviews with class teachers, and documentation (in the form of activity photos, RPPH, and student grade recapitulation). The research instruments used included guidelines for observing child and teacher activities, a Wordwall game test instrument, and a child development assessment rubric. The assessment used the following developmental achievement criteria: Very Well Developed (BSB - Score 4), Developing According to Expectations (BSH - Score 3), Starting to Develop (MB - Score 2), and Not Yet Developed (BB - Score 1).

The child development assessment rubric was built around four specific indicators of letter-shape differentiation ability: (1) accurately naming the letter shown (e.g., correctly saying "b" rather than "d"); (2) accurately pointing to or selecting the letter requested from a set of visually similar options; (3) correctly matching identical letter shapes in the Wordwall game; and (4) speed and consistency of response across repeated trials. Each indicator was scored using the BSB-BSH-MB-BB scale described above. Content validity of the observation guidelines and the Wordwall game test instrument was established through expert judgment by a lecturer in early childhood education, who reviewed the alignment between each indicator, the theoretical framework on visual discrimination (Lally, 2023), and the learning objectives, followed by minor revisions to the wording of the observation items prior to use in the pre-cycle assessment.

Data analysis was conducted using quantitative descriptive statistical techniques to calculate individual and classical completion, as well as descriptive qualitative analysis to describe the process of changing children's behavior during learning. The formula used to calculate the final individual score is $NA = (\text{Achieved Score} / \text{Ideal Maximum Score}) \times 100$. Individual completion is achieved if the child obtains a minimum score of 70. Meanwhile, the classical completion formula is $P = (\text{Number of children who completed} / \text{Total number of children}) \times 100\%$. The success indicator of this study is determined if the classical completion rate reaches $\geq 80\%$.

3. RESULTS AND DISCUSSION

3.1 Description of Initial Conditions (Pre-Cycle)

Based on observations conducted in the pre-cycle stage (May 2026) before the implementation of Wordwall media, the ability to distinguish letter shapes in 10 children in Group A was still at a low level. The learning process was still teacher-centered, relying on lecture methods and the use of whiteboards and ordinary printed letter cards. This made it difficult for children to focus their attention, and many of them were not yet able to discriminate letters that had similar visual forms, such as b-d, p-q, and m-n. Data from the results of the performance test in the pre-cycle showed very minimal achievement. The average class score was only 18.3 with a total score of 183. This had implications for the percentage of achievement that had only reached 46.25%, where only 2 children (20%) achieved learning completeness. Because this condition was far from the established success indicator of $\geq 80\%$, the researcher then designed corrective actions through the implementation of the interactive Wordwall game in Cycle I.

3.2 Implementation and Results of Cycle I

The actions in Cycle I were carried out over four meetings. At this stage, the teacher began integrating the interactive digital game Wordwall into the core learning activities. The teacher demonstrated how to play, where children were asked to match letters, spin a random wheel, and take a visual quiz to choose the correct letter b, d, p, or q. The children showed high enthusiasm for the visual display of the digital game. However, several technical and managerial obstacles were encountered during the implementation of Cycle I. Long queues that were not organized into small groups made some children bored and began to disturb their friends, and the teacher's overly complex instructions made it difficult for some children to understand the game rules.

The evaluation results at the end of Cycle I showed improvement, but did not yet reach the expected classical completion criteria. The overall score increased to 241, with the class average score rising to 24.1 and the achievement percentage reaching 74.7%. The number of children who completed the learning increased to 6 children, bringing the classical completion to 60%. Despite the improvement, this achievement did not meet the target of $\geq 80\%$ completion. Based on collaborative reflection with the class teacher, it was agreed to continue to Cycle II with improved strategies, such as simplifying instructions, dividing the class into small groups, increasing the duration of individual games, and using a more varied Wordwall template.

3.3 Implementation and Results of Cycle II

Cycle II was implemented by implementing the improvements formulated in the Cycle I reflection. Learning was designed to be more interactive and orderly by dividing 10 children into several small groups. The teacher used very simple and concrete instructional sentences, accompanied by visual examples and repeated modeling. Variations of the Wordwall game were added to not only match letters but also group letter shapes collaboratively. Children who previously experienced difficulties were given special guidance or intensive scaffolding while they played digitally.

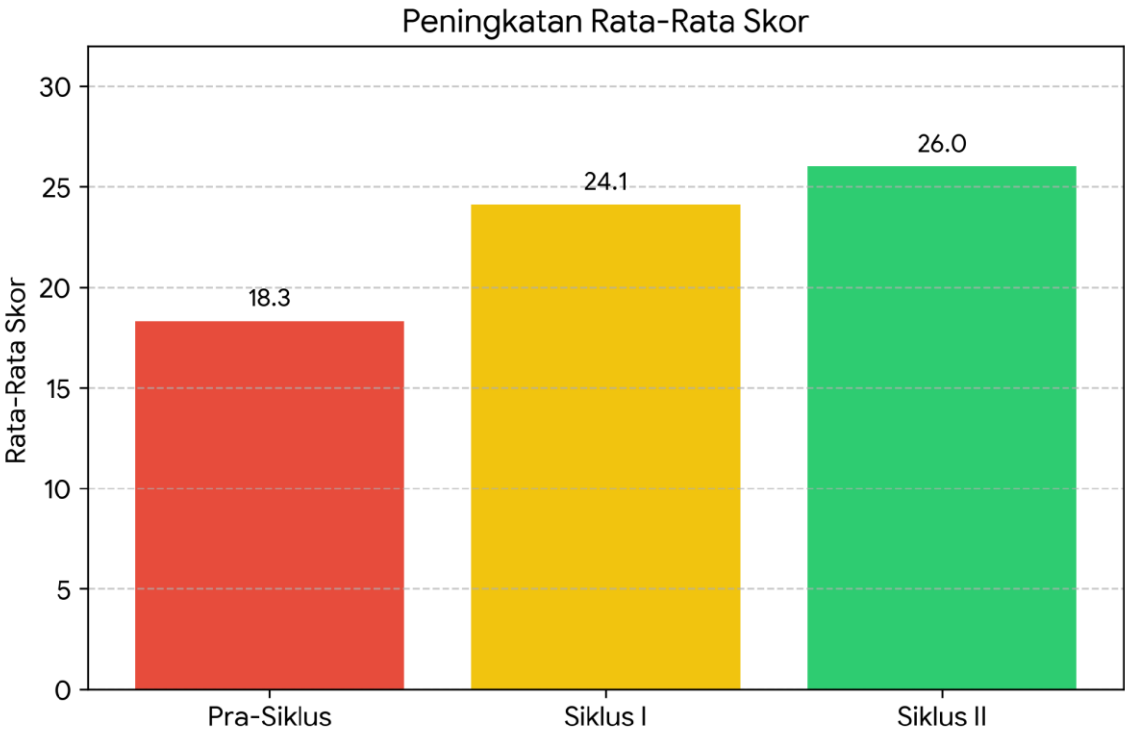
The impact of these improvements was significant. Children's active participation and concentration increased sharply. Observation and test results at the end of Cycle II recorded an increase in the overall score to 260, with an average score of 26.0. The achievement percentage also rose drastically to 81.9%. A total of 8 children successfully achieved learning mastery, bringing the classical mastery to 80%. The results obtained in Cycle II proved that the research success indicator ($\geq 80\%$) had been achieved well. The CAR was declared successful and was discontinued in Cycle II.

3.4 Inter-Cycle Discussion

The increase in children's letter-shape discrimination ability from pre-cycle to Cycle II shows a positive linear graph. A visualization of the data summary and improvement graph can be seen in the table and figure below.

Stages	Total score	Average score	Percentage of achievement	Completed child	Classical completion	Information
Pre-cycle	183	18,3	46,25%	2 Children	20%	BSH
Cycle I	241	24,1	74,7%	6 Children	60%	Experiencing improvement, but not yet reaching success indicators
Cycle II	260	26,0	81,9%	8 Children	80%	Indicators of success achieved

Table 1. Summary of Inter-Cycle Increases



Graph 1. Average Improvement in Letter Distinguishing Ability Score

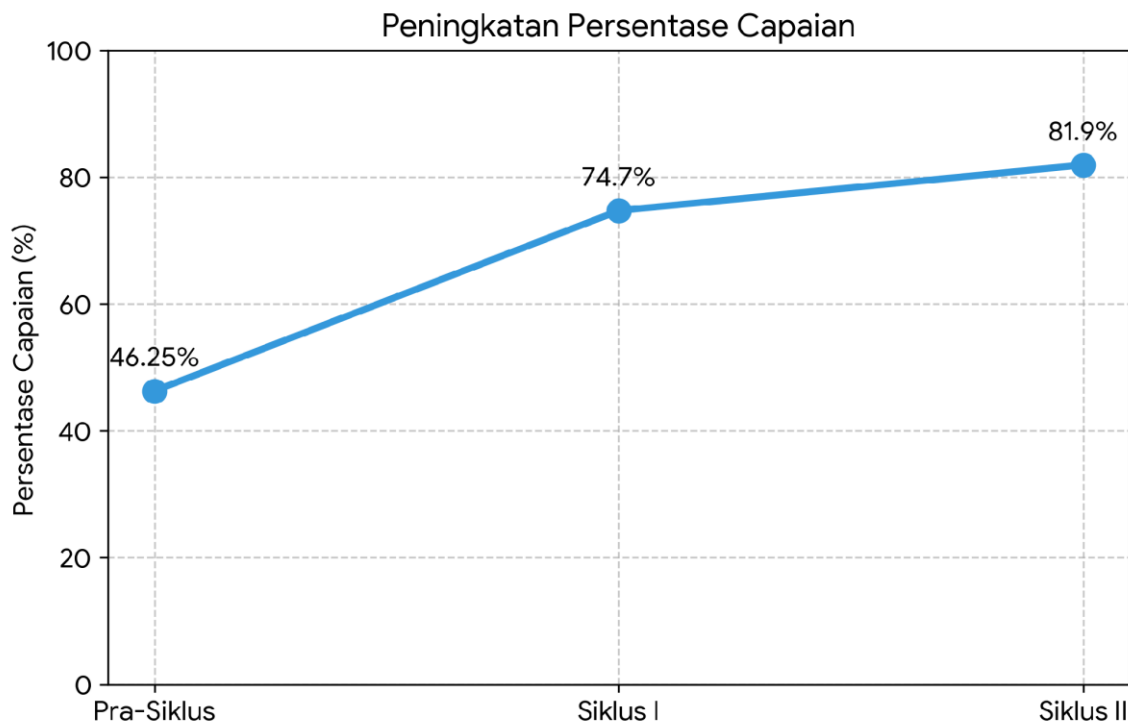


Chart 2. Increase in Percentage of Achievement

The table and graph above clearly represent the leap in children's visual literacy abilities. The increase in the average score from 18.3 (pre-cycle) to 24.1 (Cycle I) and ending at 26.0 (Cycle II) is directly proportional to the increase in the percentage of achievement from 46.25% to 74.7%, and finally reaching 81.9% (classical completion reaching 80%). This success is inseparable from the intervention of educational technology in the form of the Wordwall game, which provides a space for simultaneous multi-sensory stimulation (visual and auditory).

3.5 Strengthening Theory and Empirical Findings

The successful implementation of Wordwall in this study provides reinforcement for various theories of psychology and child cognitive development:

- 1) Cognitive Development Theory (Jean Piaget): Significant improvement from Cycle I to Cycle II is very much in line with the characteristics of the pre-operational stage of children (ages 2-7 years). According to Piaget, children at this stage are highly dependent on concrete representations. Wordwall provides concrete and repetitive manipulation of virtual objects, facilitating children to assimilate and accommodate in distinguishing line patterns in the letters b, d, p, and q.
- 2) Visual Discrimination Theory (Marianne Frostig): Frostig emphasized that visual discrimination is a key prerequisite for literacy. The Wordwall game effectively manipulates spatial perception and shape orientation through immediate feedback. Children immediately know whether their letter choices are correct or incorrect, thus training the brain's ability to analyze visual features (Lally, 2023).
- 3) Self-Determination Theory / Intrinsic Motivation (Deci & Ryan): The shift from a passive to a highly enthusiastic learning environment supports Deci & Ryan's theory. Children's basic needs for autonomy (freedom to press buttons and choose answers), competence (earning star scores or applause when correct), and social connectedness (playing with friends in small groups) are fully met through this medium. This intrinsic learning motivation accelerates children's absorption of learning materials.
- 4) Observational Learning Theory (Albert Bandura): Success in Cycle II, which achieved an indicator of 80%, is also inseparable from social interactions in the classroom. Vicarious

reinforcement occurs when children observe their peers succeed and receive appreciation, which then triggers them to replicate those learning behaviors when it's their turn.

- 5) Effectiveness of Digital Educational Game Media: The findings in this study reinforce the results of a study by Alawiyah & Rahayu (2024), which stated that web-based educational game media, specifically Wordwall.net, has a significant positive impact on the cognitive abilities of early childhood. The use of this media has been proven to shift boring conventional methods into more interactive and challenging activities, thereby stimulating children's curiosity and initiative in choosing games.

4. CONCLUSION

Based on the results of classroom action research and data analysis that have been conducted, it can be concluded that the implementation of the digital interactive game Wordwall was associated with a consistent, cycle-on-cycle improvement in the ability to distinguish letter shapes in children aged 4-5 years (Group A) at PAUD KB Al-Azkiya in the 2025/2026 academic year. This increase is shown by empirical data that consistently increases: classical learning completion in the pre-cycle stage was only 20% (2 children), then increased to 60% (6 children) in Cycle I, and reached the targeted success rate of 80% (8 children) in Cycle II. In line with this, the percentage of children's ability achievements also increased from 46.25% to 81.9% at the end of the cycle, based on descriptive comparison across cycles rather than inferential statistical testing. The use of the Wordwall platform is able to facilitate children's play needs while providing cognitive stimulation and visual discrimination that is structured, concrete, and fun. Teachers are advised to continue to innovate in integrating child-friendly educational technology to support early literacy maturity in preschool educational institutions, while future studies may consider a control-group or pre-post comparative design to more rigorously establish the extent of Wordwall's effectiveness.

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