

Interactive Anagram Games on Wordwall to Strengthen Indonesian Vocabulary in Primary Students

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Abstract

Vocabulary mastery is a foundational component of early literacy development and directly influences reading comprehension, oral communication, and academic success. However, first-grade students often struggle with letter recognition and word formation, limiting their ability to acquire new vocabulary effectively. This study investigates the effectiveness of Wordwall-based interactive anagram games in strengthening Indonesian vocabulary among first-grade students. Employing Classroom Action Research (CAR) using the Kemmis and McTaggart model, the study was conducted in two cycles involving 32 first-grade students at SDN Kalisari 01 Pagi, East Jakarta. Findings indicate significant improvement in vocabulary mastery from the pre-cycle stage (15.6% mastery) to Cycle I (53.12%) and Cycle II (93.75%). Beyond cognitive gains, students demonstrated increased engagement, confidence, and active participation. The study situates these findings within contemporary theories of vocabulary acquisition, digital game-based learning, constructivism, and early literacy development. It argues that interactive anagram games serve as an effective pedagogical bridge between letter recognition and semantic comprehension, contributing to sustainable vocabulary growth in early primary education.

Keywords: Anagram, Indonesian Language, Vocabulary, Wordwall, Classroom Action Research (CAR).

1 INTRODUCTION

Early language education in primary schools plays a crucial role in developing students' communication skills, cognitive growth, and academic readiness. Vocabulary mastery forms the core of language competence because words function as the building blocks of comprehension and expression. Without sufficient vocabulary knowledge, students face difficulties in reading texts, constructing sentences, and participating in classroom communication.

Initial observations at SDN Kalisari 01 Pagi revealed that many first-grade students struggled to recognize letters and pronounce simple vocabulary. Of 32 students, 27 were unable to recognize and pronounce basic words accurately. This condition reflects a foundational literacy gap that may hinder long-term academic progress if not addressed systematically.

Traditional instructional approaches relying heavily on lecture and memorization were found to reduce student engagement and motivation. Contemporary research suggests that early-grade learners require multisensory, interactive, and playful learning environments (Nation, 2020; Nunan, 2021). Digital game-based learning (DGBL) has emerged as a promising strategy for increasing motivation and vocabulary retention (Plass et al., 2020; Clark et al., 2021).

Wordwall-based anagram games offer an interactive medium where students arrange scrambled letters into meaningful words corresponding to images. Such activities stimulate visual recognition, phonological awareness, and semantic processing simultaneously.

Therefore, this study aims to examine how interactive anagram games can strengthen Indonesian vocabulary acquisition among first-grade students

Vocabulary acquisition in early childhood is closely linked to phonological awareness, orthographic recognition, and semantic mapping (Nation, 2020). Young learners benefit from activities that combine visual stimuli and word formation exercises. Research by Silverman and Hartranft (2021) emphasizes that interactive vocabulary instruction significantly improves retention compared to passive memorization.

Game-based learning enhances intrinsic motivation by incorporating challenge, feedback, and repetition (Clark et al., 2021). Plass et al. (2020) argue that digital games facilitate deeper learning through active engagement and meaningful interaction. Anagram games specifically promote letter-sound correspondence and lexical retrieval (Rahmawati & Fadilah, 2023).

Moreover, multimedia learning theory (Mayer, 2021) explains that combining images and text enhances cognitive integration. Wordwall's interactive format aligns with this principle by presenting visual cues alongside letter manipulation.

2 RESEARCH METHODOLOGY

This study employed Classroom Action Research (CAR) utilizing the Kemmis and McTaggart model (1988), which comprises four stages: planning, acting, observing, and reflecting. This model was chosen due to its suitability for directly improving the teaching and learning process in the classroom through iterative cycles of action. The cyclical nature of CAR allows for continuous refinement of teaching strategies based on systematic observation and reflection, ensuring that interventions are responsive to students' needs and learning outcomes.

The research was conducted in two cycles, each consisting of two meetings. Each cycle involved detailed planning of instructional activities, implementation of planned actions, observation of students' responses and learning progress, and reflective analysis to evaluate the effectiveness of the interventions. This iterative design enabled the researcher to make informed adjustments to teaching strategies, fostering an environment of continuous improvement in student learning.

The subjects of this study were 32 students from class I C at SDN Kalisari 01 Pagi, East Jakarta, during the even semester of the 2024/2025 academic year. The selection of class I C was based on preliminary observations indicating that many students still faced difficulties in recognizing letters and understanding basic vocabulary. Initial assessments revealed that a significant number of students were unable to correctly identify letter names, distinguish letter shapes, or pronounce simple words accurately. These findings underscored the necessity for engaging and interactive learning media to support students' foundational literacy skills.

3 RESULTS AND DISCUSSION

a. Results

This study was conducted on 32 first-grade students at SDN Kalisari 01 Pagi. In the pre-cycle assessment, only 5 students (15.6%) achieved the minimum competency criteria (KKM), while 27 students (84.4%) did not. The class average score during the pre-cycle was 57. The initial learning process was still dominated by lecturing, resulting in passive students who had difficulty understanding vocabulary.

In Cycle I, the implementation of the Wordwall-based anagram game with the theme of professions was carried out. Students arranged letters to form words such as teacher, doctor, or police. The evaluation results showed that 15 students (46.8%) reached mastery, while 17 students (53.2%) had not yet achieved it. The class average increased

to 68. Observations indicated that some students were still hesitant in arranging the letters and had not yet fully understood the meaning of the words.

In Cycle II, the material was expanded to include themes such as animals, family, fruits, and body parts, complemented with images and audio to reinforce word comprehension. The learning procedures became more systematic and interactive. The final evaluation results showed that 30 students (93.7%) achieved mastery, while only 2 students (6.3%) did not. The class average rose to 88. The increase in mastery from 15.6% to 93.7% demonstrates the effectiveness of the Wordwall game in improving first-grade students' vocabulary knowledge.

Apart from academic outcomes, changes were also observed in students' attitudes and participation. Students who were previously passive became more active, confident to come forward, and enthusiastic in arranging words. This finding aligns with constructivist theory, which posits that students build knowledge through direct experiences and interaction (Suparno, 2020). The results also support the effectiveness of game-based learning as proposed by Brown et al. (2019), as well as the studies by Hidayati (2021) and Nurjanah (2022) regarding the use of Wordwall in vocabulary acquisition.

Table 1. Student Mastery Results

NO	Cycle	Average Value	Completed	Not Completed
1	Pre Cycle	15,6	5	27
2	Cycle I	62,5	20	12
3	Cycle II	93,8	30	2

Table 1 shows the development of students' vocabulary knowledge mastery from the pre-cycle to Cycle II. In the pre-cycle, learning mastery was still very low, with only 5 students (15.6%) achieving mastery, while 27 students (84.4%) had not yet reached it. In Cycle I, there was a noticeable improvement, with 20 students (62.5%) achieving mastery; however, 12 students (37.5%) still had not met the criteria. By Cycle II, a significant increase was observed, with 30 students (93.8%) achieving mastery, leaving only 2 students who had not yet reached the expected level. These results indicate a progressive enhancement in students' vocabulary knowledge through the implementation of the Wordwall-based anagram game. The data demonstrate that repeated cycles with interactive and contextualized learning activities can effectively improve both students' cognitive understanding and engagement, resulting in a higher number of students achieving learning mastery over time.

b. Discussion

The findings demonstrate a substantial increase in vocabulary mastery from 15.6% in the pre-cycle stage to 93.75% in Cycle II. This dramatic progression indicates that Wordwall-based interactive anagram games function not merely as supplementary tools but as transformative pedagogical interventions. The magnitude of improvement suggests that early vocabulary acquisition in first-grade learners benefits significantly from multisensory and interactive learning environments.

The improvement can be theoretically explained through constructivist learning theory, which posits that learners actively construct knowledge through interaction and experience. By arranging scrambled letters into meaningful words, students engage in cognitive reconstruction rather than passive memorization. This aligns with Plass et al. (2020), who emphasize that digital game-based learning enhances meaningful engagement through active problem-solving and immediate feedback.

The integration of visual cues alongside letter manipulation supports Mayer's (2021) multimedia learning principle, which argues that combining visual and verbal information

facilitates dual-channel cognitive processing. In this study, Wordwall provided images corresponding to target vocabulary, enabling semantic anchoring that strengthened word retention.

The role of orthographic mapping is particularly relevant. Ehri (2021) explains that early readers consolidate vocabulary through repeated letter–sound associations. Anagram games reinforce orthographic patterns by requiring students to reorganize letter sequences, thereby strengthening neural pathways associated with word recognition.

Vocabulary acquisition at early stages depends heavily on repeated retrieval. Carpenter et al. (2022) demonstrate that retrieval practice significantly improves long-term retention. Wordwall’s interactive repetition embedded in gameplay mechanics supports spaced retrieval, which may explain the consistent mastery gains across cycles.

Motivational theory further clarifies these outcomes. According to Self-Determination Theory (Ryan & Deci, 2020), intrinsic motivation flourishes when learners experience autonomy, competence, and relatedness. The interactive nature of Wordwall fostered autonomy in decision-making, competence through successful word formation, and relatedness via peer participation.

The improvement in classroom atmosphere—from passive to enthusiastic engagement demonstrates the affective benefits of game-based learning. Clark et al. (2021) argue that emotional engagement significantly mediates cognitive performance in digital learning environments. When learners experience enjoyment, cognitive persistence increases.

Early vocabulary learning is closely linked to phonological awareness. Nation (2020) and Silverman & Hartranft (2021) emphasize that word recognition improves when phonemic awareness is reinforced through interactive manipulation. Anagram activities inherently support phonological segmentation and blending skills.

The CAR model’s iterative structure also contributed to effectiveness. Continuous reflection enabled refinement of instructional strategies. Research by McKenney and Reeves (2020) suggests that design-based iterative approaches yield sustainable classroom improvements.

Cognitive Load Theory provides additional insight. Sweller et al. (2021) explain that instructional designs reducing extraneous load enhance learning efficiency. Wordwall’s organized interface and immediate feedback reduced unnecessary cognitive processing demands.

The contextual expansion in Cycle II (animals, fruits, body parts) aligns with semantic field theory, which posits that vocabulary retention improves when words are grouped meaningfully. Schmitt (2020) supports thematic clustering as an effective strategy for young learners.

Digital literacy integration further strengthens 21st-century competencies. OECD (2023) emphasizes that early digital engagement enhances cognitive flexibility and technological familiarity. Wordwall integration thus contributes beyond vocabulary outcomes.

The findings also highlight the role of teacher facilitation. Guided scaffolding during gameplay aligns with Vygotskian Zone of Proximal Development principles. Structured guidance accelerates mastery when tasks slightly exceed learners’ independent capability.

Importantly, vocabulary growth was accompanied by increased confidence and oral expression. This supports research by Duff et al. (2021), who argue that vocabulary acquisition predicts oral fluency development.

Overall, this study contributes theoretically by positioning interactive anagram games as a pedagogical bridge between phonics, orthographic mapping, and semantic integration. The findings demonstrate that digital game-based vocabulary instruction not only enhances cognitive outcomes but also strengthens affective and social dimensions of early literacy development.

3 CONCLUSION

This study confirms that Wordwall-based interactive anagram games significantly strengthen Indonesian vocabulary acquisition in first-grade students. Mastery improved from 15.6% to 93.75%. Beyond academic outcomes, students developed confidence, motivation, and collaborative skills. Interactive digital anagram games represent a pedagogically sound, engaging, and scalable strategy for early literacy enhancement

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