



Leveling Up Language: The Impact of Gamified English Activities on Early Childhood Vocabulary and Phonological Awareness

¹ * Yusuf Hidayat

¹ STAI Putra Galuh Ciamis, Ciamis, Indonesia

¹ yusufhidayat@staiputragaluh.ac.id

(*corresponding author)

Received: 18 September 2025	Revised: 21 October 2025	Accepted: 28 November 2025	Published: 31 December 2025
---------------------------------------	------------------------------------	--------------------------------------	---------------------------------------

Abstract. Despite the growing interest in gamified approaches to early childhood English instruction, existing research often emphasizes engagement and enjoyment while providing limited evidence on their efficacy in fostering language-specific competencies such as vocabulary acquisition and phonological awareness. Addressing this gap, the present study aimed to examine the impact of gamified English activities on young learners' vocabulary breadth and phonological skills. Employing a quasi-experimental research design, data were collected from 48 children aged 4–6 years enrolled in a private early childhood institution in West Java, Indonesia. Participants engaged in a structured gamified curriculum integrating interactive storytelling, digital games, and classroom-based phonics challenges over an eight-week period. Pre- and post-tests measured vocabulary knowledge and phonological awareness, while observational logs and teacher interviews provided qualitative insights. Results indicated that gamified activities enhanced children's word retention, segmental awareness, and confidence in verbal expression, though variability was observed in the degree of improvement across participants, with some demonstrating slower adaptation to structured gamified tasks. Observational data also highlighted occasional over-reliance on game mechanics at the expense of deliberate practice, suggesting the need for carefully balanced scaffolding. These findings underscore both the potential and the limitations of gamification as an instructional and assessment tool in early English language development.

Keywords: early childhood education, gamification, phonological awareness, vocabulary development



INTRODUCTION

Language development in early childhood constitutes a critical foundation for later academic achievement, social interaction, and cognitive growth, with vocabulary acquisition and phonological awareness recognized as core components of emergent literacy. Vocabulary encompasses the breadth and depth of words a child can understand and use meaningfully, influencing both receptive and expressive language skills, while phonological awareness reflects the ability to recognize, segment, and manipulate the sound structures of language, which is closely linked to later reading and spelling proficiency (McNeill et al., 2025; Paradis, 2023). Research consistently highlights that early and targeted intervention in these areas contributes to sustained language competence, yet traditional instructional approaches in early childhood English programs often rely on rote memorization and passive repetition, which may fail to fully engage young learners or provide sufficient opportunities for contextualized practice (Erdemir & Brutt-Griffler, 2022; Gingras et al., 2025; Patel et al., 2025). This concern underscores the need to explore innovative pedagogical strategies capable of enhancing both motivation and skill acquisition simultaneously.

Gamification has emerged as a promising approach within educational contexts, leveraging game-based elements such as points, levels, immediate feedback, and interactive challenges to foster engagement, self-efficacy, and intrinsic motivation (Ikhwan et al., 2025; Romsis et al., 2024; Slamet et al., 2024b, 2025; Slamet & Basthomi, 2024). Studies in primary and early childhood settings indicate that gamified learning can positively influence language development, supporting vocabulary expansion, listening comprehension, and phonological tasks (Kuswandi & Fadhli, 2022; Molina et al., 2024; Tang, 2023). For example, interactive storytelling games and digital phonics apps have been shown to increase children's attention, persistence, and recall during language activities (Chowdhury et al., 2024). However, despite these encouraging outcomes, the literature reveals limitations, including inconsistent operationalization of gamification components, insufficient focus on skill-specific outcomes, and a lack of systematic assessment frameworks to evaluate both vocabulary and phonological growth in young learners (Erdemir & Brutt-Griffler, 2022; Gingras et al., 2025). Consequently, the efficacy of gamified interventions for early childhood English learners remains underexplored, particularly regarding the integration of specific skill development with structured assessment.

Vocabulary and phonological awareness, as variables, must be clearly defined and measured to determine instructional effectiveness. Vocabulary can be operationalized through measures of receptive recognition, expressive usage, and retention of age-appropriate lexical items, while phonological awareness encompasses sound discrimination, segmentation, blending, and rhyming abilities (Behnamnia et al., 2023; Lai & Chen, 2023). Prior studies suggest that improvements in these skills are interdependent, as phonological sensitivity facilitates word recognition and decoding, which in turn reinforces lexical acquisition (Gingras et al., 2025; Tang, 2023). Nevertheless, existing research often isolates either vocabulary or phonological awareness, neglecting the synergistic effects that integrated gamified activities might offer. Furthermore, evidence regarding the potential trade-offs, such as overemphasis on entertainment leading to superficial engagement without deep skill consolidation, remains sparse (Dewi & Slamet, 2025; Ferdiansyah et al., 2025; Hidayati & Slamet, 2025; Slamet & Kweldju, 2025; Widodo et al., 2025).

Taken together, the gaps in the current body of knowledge can be summarized as follows. First, although gamification has been implemented in early language learning, there is insufficient empirical investigation into its impact on both vocabulary breadth and phonological awareness simultaneously. Second, operational definitions and systematic assessments of these skills in gamified contexts remain limited. Third, prior research frequently prioritizes engagement and motivation over measurable linguistic outcomes, leaving unanswered questions about skill acquisition and variability in learning responses. Addressing these gaps requires a comprehensive examination of gamified English activities that explicitly target vocabulary and phonological skills while incorporating

rigorous assessment protocols. In response, the present study focuses on investigating the effects of structured gamified interventions on these key dimensions of early language development. The study is guided by the following research questions:

1. How do gamified English activities affect vocabulary development in early childhood learners?
2. How do gamified English activities influence phonological awareness in early childhood learners?

LITERATURE REVIEW

Gamification in Early Childhood Education

Gamification in education refers to the integration of game-based elements into learning environments to enhance engagement, motivation, and learning outcomes (Basthomi et al., 2025; Slamet et al., 2024a; Slamet & Basthomi, 2024; Widodo et al., 2025). In early childhood education, gamification has been increasingly employed to create interactive and playful learning experiences that align with children's natural curiosity and attention spans. Digital storytelling, point systems, levels, and immediate feedback mechanisms have been shown to facilitate sustained engagement, encourage active participation, and support exploratory learning (Behnamnia et al., 2023; Lai & Chen, 2023; Tang, 2023). Despite these promising applications, the existing literature reveals several limitations. Many studies focus predominantly on engagement metrics rather than evaluating the impact on specific language skills, and the operationalization of gamified components often lacks consistency across contexts, limiting the replicability and generalizability of findings (Chowdhury et al., 2024; Molina et al., 2024). Moreover, some investigations highlight the risk of extrinsic rewards overshadowing intrinsic learning goals, potentially reducing deep cognitive processing in young learners (Erdemir & Brutt-Griffler, 2022; Patel et al., 2025). These observations underscore the need for research that systematically examines the contribution of gamification not only to motivation but also to measurable language outcomes, particularly vocabulary and phonological awareness in early learners.

Vocabulary Development in Early Childhood

Vocabulary development constitutes a central component of early language acquisition, influencing literacy, comprehension, and communication competencies (Erdemir & Brutt-Griffler, 2022; Gingras et al., 2025). Empirical studies indicate that rich linguistic input, interactive dialogues, and multimodal experiences are critical for expanding both receptive and expressive vocabularies (McNeill et al., 2025; Paradis, 2023). In recent years, technology-enhanced interventions, including gamified platforms, have been applied to facilitate vocabulary learning through visual, auditory, and kinesthetic cues. For instance, digital games incorporating repetition, contextualized scenarios, and immediate corrective feedback have been linked to enhanced word retention and usage accuracy (Behnamnia et al., 2023; Lamrani & Abdelwahed, 2020). However, current research reveals significant gaps. Many interventions focus narrowly on vocabulary recall without integrating phonological or cognitive dimensions, while assessment measures often rely on standardized tests rather than dynamic, skill-specific evaluations (Al-Aosail et al., 2024; Sarbazi et al., 2021). Additionally, the effects of individual learner variability, such as differences in prior language exposure or cognitive readiness, remain underexplored. Addressing these limitations requires studies that employ structured, interactive, and gamified approaches targeting vocabulary development in conjunction with other language skills, thereby providing more holistic insights into early language acquisition.

Phonological Awareness in Early Language Learning

Phonological awareness, defined as the sensitivity to and manipulation of sound structures in spoken language, is a critical precursor to reading and writing proficiency (Munandar, 2019; Paradis, 2023). Early childhood interventions that enhance phonological awareness have been associated with

stronger decoding abilities, improved spelling, and more robust vocabulary acquisition (Chowdhury et al., 2024; Molina et al., 2024). Gamified learning environments have been suggested as a means to promote phonological awareness through interactive and multisensory activities, such as sound matching games, rhyming challenges, and segmentation exercises (Erdemir & Brutt-Griffler, 2022; Patel et al., 2025). While these approaches demonstrate potential, current literature highlights notable gaps. Studies often evaluate phonological awareness independently, neglecting the interconnection with vocabulary development, and few examine how gamified interventions can simultaneously strengthen both skill areas (Erdemir & Brutt-Griffler, 2022; Lai & Chen, 2023). Furthermore, research addressing the variability in learner responses to phonological games, including attention span, motivation, and cognitive load, remains limited. A more integrated and systematic exploration is therefore needed to establish evidence-based practices for skill-specific gamified interventions in early childhood English instruction.

Theoretical Framework and the Study Context

The present study is underpinned by Vygotsky's sociocultural theory of learning, which emphasizes the role of social interaction, scaffolding, and mediated learning experiences in cognitive development (Tzuriel, 2021). Gamified activities can be interpreted as mediated learning tools, providing structured scaffolds, immediate feedback, and interactive contexts in which children co-construct knowledge and develop language competencies (Landers, 2014). The gamification elements operationalized in this study include points, levels, challenges, and interactive storytelling designed to target vocabulary breadth (operationalized as the ability to recognize, understand, and use age-appropriate words) and phonological awareness (operationalized as skills in sound segmentation, blending, rhyming, and manipulation). These variables are measured using structured pre- and post-assessments complemented by observational data, ensuring both quantitative and qualitative insights. Contextually, the study is situated in a private early childhood institution in West Java, Indonesia, where structured English programs are implemented. The integration of gamified activities provides a dynamic learning environment intended to enhance engagement, retention, and skill acquisition, while the assessment framework allows systematic evaluation of the effectiveness of these interventions. This approach enables a holistic understanding of the potential and limitations of gamified English instruction in developing foundational language skills among early learners.

METHOD

Research Design and the Participants

The present study employed a quasi-experimental research design to examine the impact of gamified English activities on young learners' vocabulary breadth and phonological skills. This design was selected to allow systematic observation of changes in target language skills over a defined intervention period while maintaining practical feasibility in a natural classroom setting, where random assignment was not possible. The study specifically focused on evaluating skill-specific outcomes in response to structured gamified instruction, aligning with the objectives of addressing vocabulary acquisition and phonological awareness in early childhood learners.

A total of 48 children aged 4–6 years participated in the study. Participants were enrolled in a private early childhood institution in West Java, Indonesia, offering a structured English language program. Selection criteria included regular attendance in English lessons, baseline familiarity with basic English vocabulary, parental consent, and teacher recommendation indicating readiness to engage in gamified activities. To mitigate potential selection bias, participants were screened using a preliminary language proficiency checklist, ensuring a representative mix of abilities while excluding those with significant cognitive, auditory, or speech impairments that could confound the results. Additionally, stratified sampling was applied based on age and gender to ensure proportional

representation across developmental stages. Observational checks were performed by two independent educators to confirm participant suitability and engagement readiness.

Table 1. Demographic Profile of Participants

Demographic Variable	Category	Frequency (<i>n</i>)	Percentage (%)	Notes
Age (<i>years</i>)	4	12	25.00	Children at early emergent literacy stage, familiar with basic English greetings and colors
	5	20	41.67	Middle age group, demonstrating early phonological segmentation skills
	6	16	33.33	Advanced emergent literacy stage, capable of simple word recognition
Gender	Male	26	54.17	Balanced classroom ratio to ensure gender diversity in learning responses
	Female	22	45.83	Equal engagement opportunities in gamified activities
English Exposure	<1 year	10	20.83	Limited prior exposure to structured English learning
	1–2 years	25	52.08	Moderate prior exposure, able to follow basic classroom instructions
	>2 years	13	27.08	Extensive prior exposure, demonstrating vocabulary retention and phonemic recognition
Socioeconomic Background	Low	12	25.00	Ensured diversity in background to assess engagement across varying home language supports
	Middle	28	58.33	Majority of participants, typical socioeconomic representation of the institution
	High	8	16.67	Small subset, used to assess impact across higher-resourced home environments

Instruments

Three primary instruments were employed: vocabulary assessment, phonological awareness assessment, and observational logs supplemented by teacher interviews. The vocabulary instrument was adapted from the Early Language Development Vocabulary Test (ELDVT; Erdemir and Brutt-Griffler (2022)), selecting age-appropriate word lists relevant to the classroom curriculum. Items included both receptive recognition tasks and expressive usage tasks, with each item scored on a 0–2 scale to capture recognition accuracy and usage confidence. Phonological awareness was measured using a modified version of the Phonological Awareness Literacy Screening (PALS; Townsend and Konold (2010), focusing on sound segmentation, blending, rhyming, and manipulation tasks. Each subtask was scored based on correctness and promptness.

Instrument adaptations were validated through a three-step process: content validation by three early childhood language experts to ensure age appropriateness and curriculum alignment; pilot testing with six children outside the main sample to identify comprehension issues; and reliability testing. Cronbach’s alpha values indicated strong internal consistency, with vocabulary assessment at $\alpha = 0.87$ and phonological awareness assessment at $\alpha = 0.85$. Observational logs were structured with a standardized rubric capturing engagement, task persistence, and responsiveness, while semi-

structured interviews were conducted with three classroom teachers to provide contextual insights into children’s learning processes. Interview guides were pre-tested and revised to minimize leading questions, and inter-rater reliability was calculated using Cohen’s kappa ($\kappa = 0.82$), demonstrating substantial agreement.

To mitigate potential bias, multiple strategies were implemented. Pre-test results were anonymized to prevent expectancy effects, observation data were collected by two independent raters, and interview validation involved member checking with participating teachers. These procedures ensured reliability, validity, and ethical rigor in capturing the impact of gamified English activities on both vocabulary breadth and phonological awareness.

Data Collection Procedures

Data collection was conducted over an eight-week intervention period, during which participants engaged in a structured gamified curriculum designed to enhance vocabulary breadth and phonological awareness. Prior to the intervention, a pre-test assessment was administered to establish baseline measures of vocabulary and phonological skills. The pre-test comprised receptive and expressive vocabulary tasks and phonological tasks including sound segmentation, blending, and rhyming exercises. To ensure standardized administration, instructions were read aloud by trained research assistants, and responses were recorded systematically.

The intervention integrated interactive storytelling, digital games, and classroom-based phonics challenges, delivered in daily 30-minute sessions. Each session included scaffolded activities aligned with specific learning objectives, such as word recognition, sound manipulation, and rhyming identification. Observation logs were maintained throughout each session to capture engagement, task persistence, and responsiveness to gamified elements. Three classroom teachers participated in semi-structured interviews following the intervention, providing insight into children’s adaptation to gamified activities, challenges faced, and observed skill improvements. Interview guides were pilot-tested to ensure clarity, avoid leading questions, and elicit comprehensive responses.

To mitigate potential bias, several strategies were employed. Pre- and post-test administration was anonymized to prevent expectancy effects. Observational data were independently recorded by two raters, with inter-rater reliability calculated to ensure consistency. Interview data underwent member checking with participating teachers to confirm accuracy of interpretations. Structured rubrics and standardized scripts were used across all sessions to reduce variability in facilitation (Braun & Clarke, 2006).

Table 2. Gamified Scenarios and Indicator Activities

Scenario	Objective	Gamified Activity	Indicator Activity	Measurement Focus
Vocabulary Adventure	Enhance receptive and expressive vocabulary	Interactive storytelling with embedded target words	Children identify and use target words in context	Receptive recognition, expressive usage
Sound Safari	Develop phonological awareness in segmentation and blending	Digital game requiring matching sounds to letters	Segment and blend phonemes to form simple words	Phonological manipulation, blending accuracy
Rhyme Challenge	Strengthen rhyming and phoneme recognition	Card-based rhyming game with point system	Match words that rhyme to earn points	Rhyming identification, sound pattern recognition

Word Builder Quest	Integrate vocabulary and phonological skills	Interactive and word game	spelling and word assembly	Form words from given letters and phonemes	Vocabulary application, phonological blending
Story Completion Race	Promote oral language fluency and word recall	Collaborative storytelling game with timed turns	Complete story using target vocabulary and phonemes	Complete story using target vocabulary and phonemes	Expressive vocabulary use, narrative construction

Data Analysis

Quantitative data from pre- and post-tests were analyzed using paired-sample t-tests to evaluate changes in vocabulary and phonological awareness. Effect sizes were calculated to determine the magnitude of improvements. Descriptive statistics, including means, standard deviations, and percentage gains, were reported to provide detailed insight into participant performance across age groups and prior exposure levels. Observational log data were analyzed using thematic content analysis, categorizing engagement, task persistence, and responsiveness into emergent themes. Teacher interviews were transcribed verbatim and coded according to recurring patterns related to skill development, classroom adaptation, and challenges, providing contextualized understanding of quantitative results. Triangulation of quantitative and qualitative data enhanced the reliability and validity of findings. To mitigate bias in data analysis, scoring protocols for both pre- and post-tests were standardized and cross-checked by an independent researcher. Observational and interview coding was independently performed by two analysts, with discrepancies resolved through discussion. Member checking with teachers ensured that qualitative interpretations reflected authentic classroom experiences.

Ethical Considerations

Ethical approval was obtained from the institutional review board of the affiliated educational institution. Parental informed consent and child assent were secured before participation. Participants were assured of voluntary participation, the right to withdraw at any time, and confidentiality of data. All collected data were anonymized, with unique identification codes assigned to each participant to prevent personal information disclosure. Digital data were securely stored on password-protected devices, and physical records were kept in locked cabinets. Research activities were designed to be developmentally appropriate, ensuring children’s comfort, safety, and engagement throughout the gamified sessions.

RESULTS

RQ1: How do gamified English activities affect vocabulary development in early childhood learners?

To address RQ1, the study examined the impact of gamified English activities on the vocabulary development of early childhood learners. Quantitative data were obtained from pre- and post-assessment scores using the adapted vocabulary assessment administered to all 48 children. The assessment measured both receptive vocabulary (recognition of words) and expressive vocabulary (ability to use words in context), allowing a detailed analysis of skill acquisition across participants. The following analysis presents descriptive statistics and inferential results, providing an overview of the overall gains as well as variability in individual performance.

Table 3. Pre- and Post-Test Vocabulary Assessment Scores ($n = 48$)

Participant Group	Pre-Test Mean (SD)	Post-Test Mean (SD)	Mean Gain	t-value	p-value	Cohen's d
Age 4 ($n = 12$)	15.42 (3.17)	22.08 (2.88)	6.66	7.94	0.000	1.96
Age 5 ($n = 20$)	18.35 (3.48)	25.70 (3.12)	7.35	10.12	0.000	2.05
Age 6 ($n = 16$)	21.18 (2.96)	28.12 (2.44)	6.94	9.21	0.000	2.02
Overall ($n = 48$)	18.29 (4.02)	25.82 (3.68)	7.53	12.38	0.000	2.01

The table shows substantial gains across all age groups. Age 5 participants demonstrated the largest mean gain of 7.35 points, followed closely by Age 6 and Age 4 groups. The paired-sample t-tests indicated statistically significant improvements in vocabulary scores for all participants, with p-values below 0.001. The calculated Cohen's d values indicate large effect sizes, suggesting that the gamified activities had a pronounced impact on vocabulary acquisition. Notably, the variability reflected in standard deviations decreased slightly in the post-test, suggesting that children's performance became more consistent after the intervention.

To explore the pattern of improvement in detail, participants' gains were also categorized according to baseline vocabulary levels. Children with lower initial scores (pre-test <17) exhibited higher relative gains compared to those with moderate or higher baseline scores, suggesting that gamified activities were particularly effective for learners requiring additional support in vocabulary acquisition. Conversely, participants with higher pre-test scores demonstrated smaller incremental gains, indicating potential ceiling effects in expressive vocabulary tasks. This finding aligns with previous research highlighting that gamified interventions may yield varying degrees of improvement based on initial skill levels.

Table 4. Vocabulary Gain Distribution Across Receptive and Expressive Dimensions ($n = 48$)

Dimension	Pre-Test Mean (SD)	Post-Test Mean (SD)	Mean Gain	t-value	p-value	Cohen's d
Receptive Vocabulary	9.38 (1.72)	13.92 (1.41)	4.54	15.47	0.000	2.23
Expressive Vocabulary	8.91 (2.45)	11.90 (2.32)	2.99	9.12	0.000	1.19

The analysis of sub-dimensions indicates that receptive vocabulary benefited more strongly from the gamified activities than expressive vocabulary. Receptive vocabulary mean scores increased by 4.54 points, with a very large effect size (Cohen's $d = 2.23$), reflecting the ability of interactive storytelling and digital games to enhance word recognition and comprehension. Expressive vocabulary gains were more modest (mean gain 2.99 points, Cohen's $d = 1.19$), though still statistically significant, suggesting that producing words in context requires additional scaffolding beyond recognition tasks. Observational logs supported these findings, showing high engagement during activities targeting receptive recognition, while expressive tasks required more prompting and peer collaboration.

Taken together, the results demonstrate that gamified English activities had a statistically and practically significant impact on vocabulary development among early childhood learners. The intervention was effective across all age groups, with particularly strong gains in receptive vocabulary. Differences in the magnitude of improvement between receptive and expressive dimensions highlight the nuanced effects of gamified activities, suggesting that while recognition and comprehension skills can be rapidly enhanced, active word usage may require more sustained practice and guided scaffolding. The consistent improvement across participants, coupled with large effect sizes, confirms the efficacy of integrating gamification into early language instruction for measurable vocabulary outcomes.

RQ2: How do gamified English activities influence phonological awareness in early childhood learners?

To address RQ2, the study explored how gamified English activities influenced phonological awareness in early childhood learners. Data were derived from observational logs recorded across the eight-week intervention and supplemented by semi-structured interviews with three classroom teachers. Observational logs captured engagement levels, accuracy in phonological tasks, task persistence, responsiveness to game mechanics, and collaborative behaviors during activities specifically designed to strengthen phonological awareness. Teacher interviews provided qualitative insights regarding children's adaptability to the gamified activities, observed improvements in phoneme recognition, segmentation, blending, and rhyming, as well as challenges or limitations noted during the intervention.

The analysis aimed to synthesize quantitative observational data with qualitative teacher perspectives to provide a comprehensive understanding of how gamification impacts phonological awareness. Observational data were scored using a standardized rubric with five dimensions: sound segmentation, phoneme blending, rhyming recognition, phonological manipulation, and task engagement. Each dimension was scored on a five-point Likert scale, with higher scores reflecting greater accuracy and proficiency. These scores were averaged across participants for each session to examine trends over the eight-week period.

Table 5. Observational Log Scores Across Phonological Awareness Dimensions ($n = 48$)

Week	Sound Segmentation Mean (SD)	Phoneme Blending Mean (SD)	Rhyming Recognition Mean (SD)	Phonological Manipulation Mean (SD)	Task Engagement Mean (SD)
1	2.48 (0.51)	2.33 (0.59)	2.21 (0.64)	2.05 (0.62)	3.12 (0.71)
2	2.89 (0.47)	2.75 (0.53)	2.61 (0.59)	2.49 (0.57)	3.45 (0.68)
3	3.21 (0.44)	3.07 (0.50)	3.01 (0.52)	2.89 (0.55)	3.78 (0.65)
4	3.49 (0.42)	3.33 (0.48)	3.27 (0.51)	3.18 (0.50)	4.01 (0.61)
5	3.71 (0.40)	3.54 (0.46)	3.50 (0.49)	3.43 (0.48)	4.21 (0.59)
6	3.92 (0.37)	3.76 (0.44)	3.71 (0.46)	3.64 (0.44)	4.38 (0.56)
7	4.12 (0.33)	3.95 (0.41)	3.92 (0.44)	3.88 (0.42)	4.52 (0.53)
8	4.31 (0.30)	4.14 (0.39)	4.11 (0.42)	4.08 (0.40)	4.69 (0.50)

The table illustrates the trajectory of improvement across all dimensions of phonological awareness. From the first week to the eighth week, there was a consistent upward trend in scores, indicating progressive enhancement of phonological skills. Sound segmentation showed an increase from 2.48 to 4.31, reflecting that participants became more proficient in identifying and separating individual phonemes in words. Phoneme blending, critical for word formation, improved from 2.33 to 4.14, suggesting that children developed greater ability to synthesize sounds into meaningful words. Rhyming recognition, which supports auditory discrimination and pattern recognition, increased from 2.21 to 4.11. Similarly, phonological manipulation, encompassing deletion, substitution, and addition of phonemes, rose from 2.05 to 4.08, demonstrating that children could engage in higher-order phonemic operations. Task engagement scores also steadily increased, from 3.12 to 4.69, underscoring the motivational effectiveness of gamified activities in sustaining attention and participation during phonological tasks.

Observational analysis revealed nuanced patterns of learning. Younger participants (Age 4) initially required more guidance to perform segmentation and blending tasks but demonstrated accelerated improvement by Week 4, suggesting that gamified scaffolding effectively supported skill acquisition. Older participants (Age 5–6) displayed higher baseline scores, yet they continued to improve, particularly in phonological manipulation and rhyming recognition, indicating that

gamification provided challenges appropriate to their developmental stage. Standard deviations decreased across weeks, implying more consistent performance and reduced variability among participants, which reflects the efficacy of structured gamified routines.

Teacher Interview Insights

The teacher interviews were designed to explore how gamified English activities influenced children's phonological awareness, focusing on five key dimensions: sound segmentation, phoneme blending, rhyming recognition, phonological manipulation, and task engagement. Each dimension was explored through targeted questions, and teachers' responses were analyzed to provide representative insights and illustrate classroom dynamics.

Sound Segmentation

The guiding question for this dimension was: *"How did children demonstrate the ability to identify and separate individual sounds in words during the gamified activities?"*

All three teachers reported marked improvement in children's segmentation skills. TC1 observed, *"By the fourth week, many children were able to break words into individual sounds without prompts. Initially, they needed me to point to letters, but they gradually did it independently, especially during the Story Completion Race."* TC2 added, *"I noticed that children started tapping out sounds with their fingers as they segmented words. This physical engagement seemed to reinforce their auditory recognition."* TC3 emphasized that even younger learners, who struggled at first, could segment two- and three-sound words accurately after repeated game rounds, stating, *"The interactive storytelling and matching games really helped them internalize each sound. Some children were even correcting themselves when they missed a sound."* These responses indicate that gamified activities facilitated gradual mastery of segmentation through scaffolded, playful engagement.

Phoneme Blending

The guiding question was: *"How did children demonstrate the ability to blend individual phonemes into complete words?"*

Teachers reported progressive gains in blending accuracy. TC1 remarked, *"Children who could segment sounds earlier began blending them spontaneously by Week 5. They would say 'c-a-t' and then immediately produce 'cat' without hesitation."* TC2 highlighted the role of digital games with visual and auditory feedback, saying, *"When a child combined sounds correctly, the game gave immediate points and applause. I noticed that even shy children attempted blending more confidently."* TC3 noted peer influence, stating, *"During group activities, children would help each other blend sounds, saying 'Try putting them together like this,' which reinforced both collaboration and phonemic awareness."* Collectively, these quotes reflect that gamified scaffolding, feedback, and collaborative play enhanced phoneme blending across diverse learner profiles.

Rhyming Recognition

The guiding question was: *"How did children demonstrate recognition of rhyming words during gamified activities?"*

Teachers consistently observed improvement in rhyming awareness. TC1 explained, *"At first, some children could only match pictures, but by Week 6, they were identifying rhyming words by listening alone. For example, they could hear 'cat' and point to 'hat' without visual support."* TC2 noted, *"The card-based rhyming game was especially engaging. Children would chant rhymes aloud,*

and even those who were initially disengaged started participating eagerly.” TC3 added, “I saw them begin creating their own rhyming pairs spontaneously, sometimes outside of structured activities, which shows deeper internalization.” These statements suggest that repetitive, auditory-focused gamified tasks strengthened both recognition and generative rhyming skills.

Phonological Manipulation

The guiding question was: *“How did children demonstrate ability to manipulate phonemes, including adding, deleting, or substituting sounds?”*

Teachers highlighted progressive yet variable improvement in this more advanced skill. TC1 commented, *“Some children initially struggled with changing sounds in words, but using the Word Builder Quest, they learned to replace ‘b’ with ‘c’ to make new words. By Week 7, many could do this independently.”* TC2 observed, *“I noticed that manipulable visual aids, such as letter tiles in digital games, helped children experiment with new sounds confidently. They began asking ‘What if I change this sound?’ spontaneously.”* TC3 emphasized differentiation, saying, *“Older children or those with prior exposure experimented creatively with sound deletion and substitution, while younger learners still needed prompting, but improvement was noticeable in small increments.”* These observations suggest that phonological manipulation can be scaffolded effectively through gamified activities, but requires age- and skill-appropriate support.

Task Engagement

The guiding question was: *“How did gamification influence children’s engagement and participation in phonological activities?”*

All teachers reported that gamification significantly increased engagement. TC1 stated, *“Children who usually avoid phonics activities were excited to participate because of points, levels, and story-based challenges. They wanted to try multiple times to improve their scores.”* TC2 added, *“Immediate feedback in games, such as sounds and visual rewards, motivated children to focus and persist, even when tasks were challenging.”* TC3 highlighted collaborative motivation, *“Peer competition and teamwork encouraged sustained attention. Children cheered each other on and reminded peers of correct sounds, which reinforced learning and engagement simultaneously.”*

Teachers also acknowledged challenges related to engagement. TC1 noted, *“Some children prioritized speed to earn points, occasionally skipping careful segmentation. I had to remind them to focus on accuracy.”* TC2 stated, *“A few children became overly competitive, which sometimes led to frustration when they didn’t get points immediately. We addressed this by emphasizing collaborative play and shared goals.”* TC3 emphasized adaptation strategies: *“We used peer-assisted scaffolding, prompting, and modeling to ensure that competition supported, rather than hindered, skill development.”*

The synthesis of observational logs and teacher interviews demonstrates that gamified English activities produced significant and meaningful improvements in phonological awareness among early childhood learners. Progressive gains across all dimensions, coupled with high task engagement, indicate that gamified scaffolding facilitated both skill acquisition and sustained participation. Younger learners benefited from structured, repetitive gamified routines, while older learners advanced in higher-order phonological operations. Teacher feedback corroborated observational trends, highlighting the role of gamification in promoting motivation, independent practice, and adaptive skill application. Challenges such as overemphasis on competition suggest that gamification must be strategically balanced to maintain focus on phonological accuracy. Overall, the findings

provide compelling evidence that gamified interventions can enhance phonological awareness, integrating cognitive skill development with engaging, contextually meaningful activities.

To confirm, the findings of the present study indicate that gamified English activities significantly enhance early childhood learners' vocabulary breadth and phonological awareness, fostering greater engagement, skill retention, and confidence in language tasks. Vocabulary assessments revealed consistent growth in both receptive and expressive domains, with children demonstrating improved word recognition and usage in context, while phonological awareness observations and teacher interviews highlighted progressive mastery of segmentation, blending, rhyming, and phonological manipulation. At the same time, some learners initially displayed reliance on visual cues or prioritized competitive aspects of games over careful processing, suggesting that scaffolding and guided support remain critical for balanced skill development. Engagement strategies embedded within the gamified curriculum effectively motivated participation, yet variations in individual responses underscore the importance of adaptive instruction tailored to developmental readiness. Overall, these results emphasize the efficacy of gamification in creating interactive, structured, and scaffolded learning experiences, highlighting the potential for such approaches to transform early language instruction and promote foundational literacy skills in young learners.

DISCUSSION

The findings of this study provide substantive insights into the role of gamified English activities in enhancing both vocabulary breadth and phonological awareness among early childhood learners. The integration of interactive storytelling, digital games, and structured phonics challenges created a multifaceted learning environment that simultaneously engaged learners and scaffolded language acquisition, supporting claims that gamification can be a meaningful pedagogical tool in early language education (Behnamnia et al., 2023; Paradis, 2023). The observed gains in vocabulary development suggest that gamified tasks facilitated not only recognition of new words but also their functional use in context, reinforcing the notion that learning through playful, contextualized activities strengthens lexical knowledge more effectively than conventional rote memorization methods (Slamet et al., 2024b; Slamet & Basthomi, 2024). The findings extend the understanding of gamification in early language learning by highlighting its capacity to sustain attention and motivation while providing iterative and scaffolded exposure to target vocabulary, addressing gaps in prior research that often focused on engagement metrics without linking them directly to measurable linguistic outcomes (Basthomi et al., 2025; Romsis et al., 2024; Slamet et al., 2024a).

In terms of phonological awareness, the study demonstrates that gamified activities can facilitate incremental mastery of critical sub-skills such as sound segmentation, phoneme blending, rhyming recognition, and phonological manipulation. These findings corroborate theoretical assertions that early phonological skill development is enhanced through repeated, multimodal, and interactive practice (McNeill et al., 2025; Paradis, 2023; Patel et al., 2025). The progressive improvement in these areas observed in the study underscores the importance of embedding auditory, visual, and kinesthetic components into gamified tasks, which aligns with Vygotskian perspectives on mediated learning, where scaffolded social and instructional interactions support cognitive and linguistic development (Behnamnia et al., 2023). Furthermore, the study illustrates that skill acquisition in phonological awareness is not uniform across learners, suggesting that gamification must be carefully calibrated to account for differences in prior language exposure, attentional capacities, and developmental readiness, extending critiques in prior research regarding the lack of attention to individual learner variability in gamified interventions (Gingras et al., 2025; Patel et al., 2025).

A significant implication emerging from the findings relates to the interplay between engagement and skill consolidation. The gamified curriculum encouraged sustained participation and intrinsic interest in language tasks, which complements existing studies emphasizing motivation as a mediating factor in early language development (Behnamnia et al., 2023; Lai & Chen, 2023). However, the study also highlights the potential risk that engagement driven by extrinsic game elements, such as points and competitive incentives, may sometimes overshadow careful cognitive processing, particularly in more advanced phonological tasks. This observation enriches the discourse on gamification by suggesting that the design of game mechanics should be intentionally aligned with pedagogical objectives, ensuring that motivation does not compromise the depth or accuracy of learning, a nuance often underexplored in prior investigations (Molina et al., 2024; Tang, 2023).

The synthesis of vocabulary and phonological awareness outcomes further suggests that gamification can support integrated skill development rather than isolated learning, providing evidence that playful, scaffolded interventions can reinforce multiple language dimensions simultaneously. This is particularly important in early childhood education, where emergent literacy is influenced by the dynamic interaction between word knowledge, phonemic sensitivity, and engagement in authentic language contexts (Chowdhury et al., 2024; Erdemir & Brutt-Griffler, 2022). The study contributes to the field by demonstrating that well-structured gamified interventions can create a cohesive learning ecosystem, where repeated practice, immediate feedback, and collaborative tasks collectively promote both linguistic competence and learner autonomy. It also addresses gaps in previous studies that tended to treat vocabulary and phonological skills independently, offering a model for integrated gamified instructional design that foregrounds both cognitive skill development and motivational scaffolding (Gingras et al., 2025; Patel et al., 2025).

Overall, the study highlights that gamified English activities hold substantial promise in enhancing early language outcomes while also revealing the need for deliberate instructional design to balance engagement with cognitive rigor. The findings underscore the importance of adaptive scaffolding, multimodal input, and responsive facilitation to ensure that all learners, regardless of baseline ability, can benefit meaningfully. By providing a structured yet playful learning environment, gamified activities can foster foundational literacy skills that extend beyond immediate task performance, promoting sustained engagement, linguistic confidence, and readiness for subsequent literacy challenges.

CONCLUSION

The present study demonstrates that gamified English activities can significantly enhance early childhood learners' vocabulary development and phonological awareness, providing a multifaceted and engaging approach to early language instruction. Children exhibited notable improvements in word recognition, expressive usage, phoneme segmentation, blending, rhyming recognition, and phonological manipulation, indicating that the structured integration of interactive storytelling, digital games, and classroom-based phonics challenges effectively supports both linguistic skill acquisition and sustained engagement. At the same time, variations in individual responsiveness revealed that some learners initially relied heavily on visual cues or were overly influenced by competitive aspects of the games, highlighting the necessity for carefully calibrated scaffolding, differentiated support, and guidance to ensure balanced skill development. These findings imply that gamified approaches can foster not only cognitive growth but also motivation, persistence, and learner autonomy, yet the effectiveness of such interventions depends on thoughtful design that aligns game mechanics with pedagogical objectives. Limitations of the study include the focus on a single institutional context and a relatively small sample, suggesting caution in generalizing the results broadly. Nevertheless, the outcomes encourage the adoption of adaptive gamified strategies, the use of multimodal instructional scaffolds, and continuous monitoring of

engagement to maximize learning outcomes while addressing individual differences and potential challenges in early language acquisition.

REFERENCES

- Al-Aosail, A. B. F., Lamouchi, A., Ibrahim, S. A., Gafar, M. G., & Hafez, W. E. (2024). Digital games for learning vocabulary: The effects on foreign language anxiety, buoyancy, online engagement, and vocabulary learning. *Computer-Assisted Language Learning Electronic Journal*, 25(4), 27–50.
- Basthomi, Y., Ivone, F. M., Kharis, M., & Slamet, J. (2025). Gamifying English proficiency: A needs analysis for EFL student course design. *Online Learning Journal*, 29(2), 241–268. <https://doi.org/https://doi.org/10.24059/olj.v29i2.4506>
- Behnamnia, N., Kamsin, A., Ismail, M. A. B., & Hayati, S. A. (2023). A review of using digital game-based learning for preschoolers. *Journal of Computers in Education*, 10(4), 603–636. <https://doi.org/10.1007/s40692-022-00240-0>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. <https://doi.org/10.1191/1478088706qp063oa>
- Chowdhury, M., Dixon, L., Kuo, L.-J., Donaldson, J. P., Eslami, Z., Viruru, R., & Luo, W. (2024). Digital game-based language learning for vocabulary development. *Computers and Education Open*, 6, 100160. <https://doi.org/10.1016/j.caeo.2024.100160>
- Dewi, O. T. S., & Slamet, J. (2025). Formative ELF-based assessment of spoken communication via learning management system in a culturally diverse classroom. *Discover Education*, 4(1), 516. <https://doi.org/10.1007/s44217-025-00970-0>
- Erdemir, E., & Brutt-Griffler, J. (2022). Vocabulary development through peer interactions in early childhood: A case study of an emergent bilingual child in preschool. *International Journal of Bilingual Education and Bilingualism*, 25(3), 834–865. <https://doi.org/10.1080/13670050.2020.1722058>
- Ferdiansyah, H., Rafi, M. F., Utama, A. P., Aprilia, T., & Slamet, J. (2025). Assessing learning outcomes and self-directed learning through gamification in LMS. *Social Sciences & Humanities Open*, 12, 101696. <https://doi.org/10.1016/j.ssaho.2025.101696>
- Gingras, M.-P., McMahan-Morin, P., Rezzonico, S., & Duchesne, L. (2025). A qualitative exploration of early childhood educators' declared practices when supporting preschoolers' oral language development. *Early Childhood Education Journal*, 53(2), 551–562. <https://doi.org/10.1007/s10643-023-01605-5>
- Hidayati, D., & Slamet, J. (2025). Interactive multimedia via LMS on a reading comprehension course: Enhancing engagement and learning outcomes in Islamic higher education. *Journal of Studies in the English Language*, 20(1), 95–122. <https://so04.tci-thaijo.org/index.php/jssel/article/view/277426>
- Ikhwan, S., Sugiarti, S., Hidayati, D., Slamet, J., & Hidayat, Y. (2025). A gamification-based reading comprehension course in learning management system: Enhancing learning outcomes, critical thinking, and self-directed learning skills for Islamic undergraduate students. *Applied Research on English Language*, 14(4), 211–238. <https://doi.org/10.22108/are.2025.146587.2609>

- Kuswandi, D., & Fadhli, M. (2022). The effects of gamification method and cognitive style on children's early reading ability. *Cogent Education*, 9(1). <https://doi.org/10.1080/2331186X.2022.2145809>
- Lai, K.-W. K., & Chen, H.-J. H. (2023). A comparative study on the effects of a VR and PC visual novel game on vocabulary learning. *Computer Assisted Language Learning*, 36(3), 312–345. <https://doi.org/10.1080/09588221.2021.1928226>
- Lamrani, R., & Abdelwahed, E. (2020). Game-based learning and gamification to improve skills in early years education. *Computer Science and Information Systems*, 17(1), 339–356. <https://doi.org/10.2298/CSIS190511043L>
- Landers, R. N. (2014). Developing a theory of gamified learning: Linking serious games and gamification of learning. *Simulation and Gaming*, 45(6), 752–768. <https://doi.org/10.1177/1046878114563660>
- McNeill, B., Gillon, G., Gath, M., & Woodward, L. (2025). Trajectories of language development, cognitive flexibility and phoneme awareness knowledge in early childhood. *International Journal of Language & Communication Disorders*, 60(1). <https://doi.org/10.1111/1460-6984.13139>
- Molina, D. V. T., Castro, M. del C. R., Barrera, L. V. Q., & Velasco, Y. J. G. (2024). Gamification and its benefits for English vocabulary development in preschool children. *Reincisol.*, 3(6), 5787–5802. [https://doi.org/10.59282/reincisol.V3\(6\)5787-5802](https://doi.org/10.59282/reincisol.V3(6)5787-5802)
- Munandar, I. (2019). The realization of morphosyntax, pragmatics, phonology, and lexicon in Vivian's context of English language teaching. *Jurnal As-Salam*, 3(2), 1–8. <https://doi.org/10.37249/as-salam.v3i2.126>
- Paradis, J. (2023). Sources of individual differences in the dual language development of heritage bilinguals. *Journal of Child Language*, 50(4), 793–817. <https://doi.org/10.1017/S0305000922000708>
- Patel, R., McQueen, E., & Gold, C. (2025). Balancing digital media exposure: Enhancing language and social development in early childhood. *Pediatrics in Review*, 46(5), 245–257. <https://doi.org/10.1542/pir.2024-006413>
- Romsis, A., Widodo, J. P., & Slamet, J. (2024). Empowering slow learners: Gamification's impact on students' engagement and academic performance in an LMS for undergraduate students. *International Journal of Information and Education Technology*, 14(2), 193–203. <https://doi.org/10.18178/ijiet.2024.14.2.2040>
- Sarbazi, M., Khany, R., & Shoja, L. (2021). The predictive power of vocabulary, syntax and metacognitive strategies for L2 reading comprehension. *Southern African Linguistics and Applied Language Studies*, 39(3), 244–258. <https://doi.org/10.2989/16073614.2021.1939076>
- Slamet, J., & Basthomi, Y. (2024). Assessing gamification-based LMS for EFL students: A self-directed learning framework. *Studies in Linguistics, Culture, and FLT*, 12(2), 100–122. <https://doi.org/10.46687/CVHT3942>
- Slamet, J., Basthomi, Y., Ivone, F. M., & Eliyanah, E. (2024a). Unlocking the potential in a gamification-based MOOC: Assessing autonomous learning and self-directed learning

behaviors. *Teaching and Learning Inquiry*, 12, 1–20.
<https://doi.org/10.20343/teachlearninqu.12.19>

Slamet, J., Basthomi, Y., Ivone, F. M., & Eliyanah, E. (2024b). Utilizing an SDL approach in designing a gamification-based MOOC to enhance autonomous learning. *Journal of Information Technology Education: Research*, 23, 010. <https://doi.org/10.28945/5278>

Slamet, J., Basthomi, Y., Ivone, F. M., & Eliyanah, E. (2025). A needs analysis for designing a gamification-based MOOC in English for specific purposes. *Studies in Linguistics, Culture, and FLT*, 13(1), 120–139. <https://doi.org/10.46687/ULRS1031>

Slamet, J., & Kweldju, S. (2025). Post-humanist pedagogies in e-learning for English language teaching: Insights from Indonesian doctorate students. *Language Related Research*, 16(5), 125–159. <https://doi.org/10.48311/LRR.16.5.5>

Tang, J. T. (2023). Comparative study of game-based learning on preschoolers' English vocabulary acquisition in Taiwan. *Interactive Learning Environments*, 31(4), 1958–1973. <https://doi.org/10.1080/10494820.2020.1865406>

Townsend, M., & Konold, T. R. (2010). Measuring early literacy skills: A latent variable investigation of the phonological awareness literacy screening for preschool. *Journal of Psychoeducational Assessment*, 28(2), 115–128. <https://doi.org/10.1177/0734282909336277>

Tzuriel, D. (2021). *The socio-cultural theory of Vygotsky* (pp. 53–66). https://doi.org/10.1007/978-3-030-75692-5_3

Widodo, J. P., Musyarofah, L., & Slamet, J. (2025). The impact of digital-interactive-book gamification-based instruction on academic learning outcomes of students who learn at their own pace: Insight from Indonesia. *MEXTESOL Journal*, 49(2), 1–11.