



From Reading to Writing: The Effect of a Gamified Mini-Story Application on Elementary Students' Writing Skills

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Abstract

Elementary students often find it difficult to transform ideas gained from reading into coherent written stories. This study examined the effectiveness of the gamified Baca dan Tulis Cerita Mini application in supporting third-grade students' mini-story writing skills and described its classroom implementation. A quantitative quasi-experimental study was conducted using a pretest-posttest non-equivalent control group design with 56 students from MIMA KH. 01 KH. Shiddiq, Jember, Indonesia. Twenty-eight students participated in the experimental group and learned through the gamified application, while 28 students in the control group received conventional instruction. Students' writing was assessed using an analytic rubric covering content relevance, story structure, coherence, vocabulary, sentence accuracy, and creativity. Data were analysed using descriptive statistics, the Shapiro-Wilk normality test, Levene's test, paired-samples t-test, and independent-samples t-test. The experimental group's mean writing score increased from 72.11 to 95.11, whereas the control group improved from 71.14 to 76.46. The within-group analysis showed significant improvement in the experimental group, $t(27) = -30.858$, $p < .001$, while the posttest comparison also indicated a significant difference between groups, $t(54) = 29.612$, $p < .001$. Classroom observations indicated that students generally followed the application sequence after initial guidance and remained involved in the learning activities. The findings suggest that integrating model reading, guided activities, and gamified progression can support elementary students in developing more structured, coherent, and creative mini-stories.

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INTRODUCTION

Writing is often regarded as one of the most demanding literacy activities for elementary school students because it requires several processes to operate at the same time (Dahlström, 2022; Jusslin & Höglund, 2021; Kim & Zagata, 2024). Even a short narrative asks children to generate ideas, select relevant information, organise events, choose suitable vocabulary, construct sentences, and maintain connections across the text. These demands become more challenging when students are still developing their vocabulary, knowledge of narrative structure, transcription skills, and ability to regulate their own writing processes. As a result, young learners may be able to understand a story when reading it but struggle when they are asked to transform their understanding into an original written text (Alemi et al., 2022; Kim & Zagata, 2024). This discrepancy is important because literacy development cannot be considered complete when students can recognise or comprehend texts without being able to communicate their own ideas in writing. Research on primary-grade writing indicates that explicit and structured instruction can improve students' writing, although the benefits vary according to the focus of instruction and characteristics of learners (Wang & Troia, 2023). Writing instruction, therefore, needs to provide children with sufficient models, guidance, and opportunities to develop ideas before they are expected to produce an independent text. The

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challenge is not simply how to teach children to write more, but how to help them move meaningfully from understanding existing texts to constructing their own stories.

The relationship between reading and writing provides an important starting point for addressing this challenge. Children encounter narrative structures, vocabulary, sentence patterns, characters, settings, and relationships among events through reading, all of which can become resources for their own writing. Reading and writing should consequently be understood as interconnected literacy practices rather than as two completely separate classroom activities. Simpson & Cremin (2022) argue that positioning children as both readers and writers can provide a stronger foundation for literacy learning because students draw on what they read when developing their own texts. This relationship is particularly relevant for elementary students, who may find it difficult to generate content independently when confronted with a blank page. A short story can provide a concrete stimulus from which students identify ideas, examine narrative organisation, and subsequently construct a different story in their own words. Story-based materials developed for elementary education have likewise been used to provide visual stimuli, narrative models, and structured opportunities for writing practice (Thompson & Childers, 2021). The practical issue, however, is how to organise this reading-to-writing transition so that students remain actively involved while receiving sufficient guidance. This concern creates an opportunity to integrate story-based learning with digital environments that can structure the process more interactively.

Digital technology has expanded the possibilities for organising literacy instruction beyond conventional textbooks and worksheets. Digital learning environments can combine written texts, images, activities, feedback, and opportunities for students to create their own products within one instructional sequence (Kiryakova, 2022; Suartama et al., 2024). Such integration is potentially valuable for writing because students need support not only during the final act of composing but also during idea development and text organisation. Research on digital tools has shown that technology can facilitate writing instruction and feedback when its functions are aligned with clearly defined learning objectives (Li & Wilson, 2025; Ruiz-Rojas et al., 2023). At the same time, the presence of technology does not automatically improve learning, since excessive or poorly organised multimedia information may compete for students' limited cognitive resources (Al-khresheh, 2024; Ghafouri et al., 2024; Veddayana et al., 2025). The educational value of a digital application therefore depends on whether its features help students focus on the essential processes involved in learning. For young writers, this means that an application should do more than display stories on a screen; it should guide students through meaningful activities that connect reading, understanding, planning, and writing. The need for such an integrated learning environment becomes particularly urgent when elementary students must develop narrative writing skills while maintaining attention and motivation during the learning process.

Gamification offers one possible way of structuring this type of digital learning environment. Rather than treating writing as a single demanding assignment, gamified instruction can divide learning into smaller missions and provide visible indicators of progress through points, badges, or other game elements. These features may encourage students to participate and persist when completing tasks that require sustained cognitive effort (Bakhtiari Moghadam et al., 2023; Sulis, 2022). Recent research has associated gamification with improvements in student engagement and learning outcomes, although the magnitude and direction of these effects depend strongly on how game elements are designed and integrated into instruction (Gyedu et al., 2026a). Systematic evidence from K–12 education also indicates that gamification does not consistently produce positive outcomes simply because game elements are present (Kalogiannakis et al., 2021; Zeybek & Saygi, 2024). The central issue is therefore not whether learning should become more game-like, but whether game features can support the actual competence that students are expected to develop. In writing instruction, progress indicators and missions may be particularly meaningful when they correspond to stages of reading, idea development, story organisation, and composition rather than functioning as unrelated rewards. Consequently, a gamified application that deliberately connects reading materials with guided writing activities may provide a more coherent learning experience than a digital platform that merely adds rewards to conventional exercises.

Previous studies provide encouraging evidence for the use of gamification in literacy and writing education, but their findings remain diverse in scope and context. Jackson et al. (2022) and Nash & Brady (2022), through a scoping review of game-related approaches in writing classrooms,

found that digital games, points, storylines, role-playing, and other game elements have been used to create interactive writing environments and extend opportunities for practice. Zhou (2024) similarly showed that gamification can support aspects of writing such as idea generation, character development, writing fluency, agency, and motivation. Research involving primary-school learners has also reported promising results, with Kuswandi & Fadhli (2022) and Liman Kaban & Karadeniz (2021) finding that gamified literacy training could support reading and writing performance among children aged 8 to 11 years. Kuswandi & Fadhli (2022) reported positive outcomes from gamified learning in improving creative reading skills among primary school students, Found improvements in elementary students' writing skills following the use of Classcraft. Other studies have examined gamification in broader language-learning contexts and reported benefits for writing performance, participation, motivation, or engagement (Almufareh, 2021). Systematic reviews further suggest that gamified learning can influence academic performance and engagement, although outcomes vary according to learner characteristics, educational level, and instructional design (Gyedu et al., 2026). Taken together, these studies establish a growing empirical basis for gamification in literacy education while also indicating that the effectiveness of gamification depends on the relationship between technology, learning tasks, and pedagogical objectives.

Despite this growing body of evidence, several limitations remain evident in previous research. First, many studies have examined gamification through broad outcomes such as academic achievement, motivation, engagement, or general language performance, while fewer have focused specifically on the quality of narrative writing produced by young elementary learners (Camacho et al., 2021). Second, research on gamified writing has covered different educational levels and writing purposes, making it difficult to determine how the findings apply to early narrative composition in elementary classrooms. Third, reading and writing are frequently examined as separate learning outcomes, even though children naturally draw on texts they have read when generating and organising their own stories (Graham et al., 2024). Fourth, Indonesian research on story-based literacy media has produced valuable instructional products, including story calendars and Big Book materials, but many studies have concentrated on development, expert validation, feasibility, or user responses rather than comparative evidence of learning effectiveness (Gadke et al., 2021; Mergen et al., 2024). International evidence is useful for establishing the potential of gamification, yet differences in language, curriculum, classroom organisation, technological infrastructure, and learner characteristics limit the direct transfer of those findings to Indonesian elementary schools. Moreover, some existing studies provide limited information about how students actually move through the instructional process from reading a model story to producing an independent text. These limitations reveal a specific research gap: empirical evidence remains limited on a locally developed gamified application that integrates model reading, guided activities, gamified progression, and independent mini-story writing within one continuous elementary classroom intervention.

Addressing this gap requires a research design that evaluates not only whether a digital application is feasible or engaging, but also whether students using it achieve better writing outcomes than students receiving conventional instruction. A quasi-experimental comparison is particularly relevant because it allows the effectiveness of the application to be examined under authentic classroom conditions while retaining a comparison group. Such an approach can extend previous development-oriented studies by providing direct evidence of changes in students' writing performance. The present study therefore focuses on the *Baca dan Tulis Cerita Mini* application, which was designed to place reading and writing within a connected learning sequence. Students first encounter a short story that provides narrative ideas and linguistic models, then complete guided interactive activities before composing their own mini-stories. Missions, points, badges, progress indicators, and a leaderboard are incorporated into this sequence to support participation and task completion, while the teacher continues to facilitate learning rather than being replaced by the technology. This arrangement reflects the principle that gamification should serve instructional objectives rather than function as an independent layer of entertainment (Chen & Wang, 2025; Christensen, 2024). Examining the intervention in an Indonesian elementary classroom can therefore provide context-specific evidence about how an integrated reading-to-writing and gamified approach functions in practice.

Accordingly, this study aims to examine the effectiveness of the gamified Baca dan Tulis Cerita Mini application in improving the mini-story writing skills of third-grade elementary students and to describe its implementation in an authentic classroom setting. Specifically, the study investigates changes in students' writing performance before and after the application-based intervention and compares the post-intervention performance of students who use the application with that of students who receive conventional instruction. Writing performance is examined across content relevance, story structure, coherence, vocabulary, sentence accuracy, and creativity so that improvement can be considered as a multidimensional writing outcome rather than as a single overall score. Classroom observations are also used to provide contextual information concerning student participation, teacher facilitation, supporting conditions, and implementation constraints. Theoretically, the study contributes to the literature by extending the discussion of gamification from general engagement and achievement toward an integrated reading-to-writing process in elementary narrative composition. Practically, the findings may assist elementary teachers and educational technology developers in designing literacy activities in which digital game elements are directly connected to the processes of reading, idea development, narrative organisation, and independent writing. More broadly, the study offers evidence from an Indonesian elementary-school context that can help clarify how a carefully structured gamified environment may support young learners in making the transition from reading a model text to becoming authors of their own stories.

METHOD

Research Design

This study employed a quantitative quasi-experimental approach using a pretest–posttest non-equivalent control group design. The design was selected because the participants were members of intact classes that had been established by the school before the study, making individual random assignment impractical. This design enabled the researchers to examine changes in students' mini-story writing performance following the intervention while retaining a comparison group that received conventional instruction. Both groups completed an individual writing pretest before instruction and an equivalent posttest after the instructional session. The experimental group received instruction through the gamified Baca dan Tulis Cerita Mini application, whereas the control group learned through the conventional classroom approach using textbooks and student worksheets. The same learning topic, objectives, and instructional duration were maintained across the two groups so that the principal difference between conditions was the learning medium. Classroom observations, field notes, and documentation were also collected to provide contextual information about the implementation of the intervention, student participation, teacher facilitation, and technical conditions. The overall design therefore enabled the researchers to evaluate the application's effectiveness while documenting how the intervention operated in an authentic elementary classroom setting.

Research Setting and Time

The research was conducted at MIMA KH. 01 KH. Shiddiq, Jember, East Java, Indonesia, within the context of regular elementary classroom instruction. The study constituted the implementation and evaluation phase of a multiyear research and development project in which the Baca dan Tulis Cerita Mini application had previously undergone needs analysis, product design, expert review, limited testing, and refinement. The present phase moved beyond product development by examining the application under authentic classroom conditions. Data collection was conducted on 22 May 2026 during one instructional meeting lasting 2×45 minutes. Before the intervention, the researchers prepared the learning materials and instruments, checked the application, and ensured the availability of computers and internet access. Both groups studied the same mini-story writing topic and received equivalent instructional time. The experimental group used the gamified application, whereas the control group received conventional instruction from the classroom teacher. This setting enabled the intervention to be evaluated within the students' regular learning environment rather than under an artificial experimental condition.

Population and Participants

The participants comprised 56 third-grade students from two accessible classes at MIMA KH. 01 KH. Shiddiq, Jember, Indonesia. Class IIIA, consisting of 28 students, was assigned as the experimental group, whereas Class IIIB, also consisting of 28 students, served as the control group. Because all students enrolled in the two accessible classes participated in the study, total sampling was applied within the accessible population, while the two classes were retained as intact groups. Individual students were not reassigned because maintaining the existing classroom structure allowed the intervention to be conducted within the school's regular instructional organisation. Before data collection, the research team coordinated with the school principal and classroom teachers regarding class designation, learning schedules, instructional objectives, teaching materials, time allocation, and digital facilities. All 56 students completed the pretest, instructional activities, and posttest; therefore, no participant data were excluded from the analysis. The use of the entire accessible class population allowed the study to examine the application under the actual classroom conditions for which the instructional medium was developed.

Research Instruments

The primary research instrument was an individual mini-story writing test administered during the pretest and posttest. Students were instructed to write a short narrative based on a predetermined theme and to develop the story independently in their own words. No assistance concerning the content of the stories was provided by the teacher or researchers during the assessment. A performance-based writing task was selected because the intended outcome was students' actual ability to generate, organise, and communicate ideas through written narrative rather than their perceptions of their own writing ability (Althobaiti et al., 2022). Students' writing performance was assessed using an analytic rubric comprising six dimensions: content relevance to the theme, completeness of story structure, coherence of ideas, vocabulary use, sentence accuracy, and creativity. Content relevance and story structure were each assigned a maximum of 20 points, while coherence, vocabulary, sentence accuracy, and creativity were each assigned a maximum of 15 points, producing a total possible score of 100. The rubric was developed from the operational definition of mini-story writing and adjusted to the developmental characteristics of third-grade students. In addition to the writing test, a classroom observation sheet, field notes, and documentation were used to record student participation, responses to learning activities, teacher assistance, technical difficulties, application screenshots, photographs, and examples of students' written work.

Validity and Reliability of the Instruments

The writing rubric was reviewed in terms of indicator relevance, clarity of assessment criteria, readability of the instructions, appropriateness for third-grade students, and alignment between the writing task and the intended writing competence. The same task format, assessment dimensions, and scoring rules were applied during the pretest and posttest to maintain measurement consistency. The six rubric dimensions were intended to represent complementary aspects of elementary narrative writing rather than reducing writing performance to a single general judgement. The observation sheet and documentation procedures were also aligned with the research objectives and were used primarily to describe the implementation of the intervention and provide contextual information for interpreting the quantitative results. However, the research records available for this study did not contain a numerical inter-rater reliability coefficient or another statistical reliability estimate for the writing rubric. Therefore, no unsupported reliability coefficient is reported in this manuscript. This limitation is explicitly acknowledged because evidence of content validity and evidence of scoring reliability represent different aspects of performance-based assessment quality (Althobaiti et al., 2022). The absence of a numerical inter-rater reliability estimate is subsequently considered when interpreting the limitations of the writing assessment.

Data Collection Procedure

Data collection followed a sequential procedure consisting of preparation, pretesting, instructional intervention, posttesting, observation and documentation, and data organisation. Before the lesson, the researchers coordinated with the school, prepared the learning materials and research instruments, checked the application, and verified the availability of computers and internet connectivity. Both groups then completed the individual writing pretest, in which students produced

a mini-story independently according to the predetermined instructions. After the pretest, students in the experimental group received an orientation on how to access the application, follow the learning sequence, and complete the available activities. They first read a short story that provided a model of narrative content and organisation, completed interactive missions, and subsequently composed their own mini-stories. The application incorporated missions, points, badges, a progress indicator, and a leaderboard as components of the learning sequence, while the teacher remained present as a facilitator and provided assistance when students encountered technical difficulties or required clarification. In contrast, students in the control group studied the same mini-story writing topic through conventional classroom instruction using textbooks and student worksheets. After the instructional activities, both groups completed the posttest using an equivalent writing-task format and the same analytic scoring rubric, while observations, field notes, photographs, application screenshots, and examples of students' work were collected to document the implementation process.

The complete sequence of the research and data collection procedure is presented in Table 3.

Table 1. Research Procedure and Data Collection Flow

Stage	Research Activity	Description
Preparation	Research preparation and coordination	The researchers coordinated with the school principal and classroom teachers, prepared the learning materials and research instruments, checked the <i>Baca dan Tulis Cerita Mini</i> application, and ensured the availability of computers and internet access.
Pretest	Initial writing assessment	Students in both the experimental and control groups individually completed a mini-story writing task before receiving the instructional treatment. The pretest was used to identify students' initial writing performance.
Intervention	Experimental and control instruction	The experimental group learned through the gamified <i>Baca dan Tulis Cerita Mini</i> application, beginning with a model story, followed by interactive missions and guided activities before composing their own mini-stories. The control group received conventional instruction using textbooks and student worksheets. Both groups studied the same topic and received the same instructional duration.
Posttest	Final writing assessment	After the instructional session, students in both groups completed an equivalent mini-story writing task. The same analytic writing rubric was used to assess content relevance, story structure, coherence, vocabulary, sentence accuracy, and creativity.
Observation and Documentation	Classroom implementation recording	During the intervention, the researchers recorded student participation, responses to learning activities, teacher facilitation, technical difficulties,

		and classroom conditions. Photographs, application screenshots, and examples of students' written work were also collected as supporting documentation.
Data Organization and Analysis	Data scoring and preparation	Students' writing was scored using the analytic rubric, and the quantitative results were organized for descriptive and inferential statistical analysis. Observation records and field notes were organized descriptively to provide contextual information for interpreting the quantitative findings.

Note. The research procedure was adapted from the implementation and evaluation procedures described in the present study.

Data Analysis Technique

The quantitative writing scores were analysed using descriptive and inferential statistics. Descriptive analysis included the minimum score, maximum score, mean, and standard deviation for the pretest and posttest scores of each group. Before inferential analysis, the Shapiro–Wilk test was used to examine the normality of the score distributions, while Levene's test was used to assess the homogeneity of variance between the groups. All statistical decisions were based on a significance level of $\alpha = .05$. A paired-samples t-test was used to determine whether the experimental group demonstrated a statistically significant change in writing performance between the pretest and posttest. An independent-samples t-test was subsequently used to compare the posttest writing scores of the experimental and control groups and determine whether the two instructional conditions produced significantly different outcomes. Observation records and field notes were analysed descriptively by grouping the information into implementation, student engagement and responses, supporting conditions, and implementation constraints. These contextual findings were used to complement and clarify the quantitative results rather than to establish a separate qualitative outcome. The statistical procedures were selected in accordance with the characteristics of the data and the quasi-experimental design, with the interpretation of the results guided by the established significance criterion.

RESULTS AND DISCUSSION

Results

The learning activities were completed as planned in both classes. Students in the experimental group began with an orientation to the Baca dan Tulis Cerita Mini application, read the story provided in the application, completed the interactive missions, and wrote their own mini-stories. Students in the control group studied the same topic using textbooks and worksheets. All 56 participants completed the pretest, instructional activities, and posttest, so no participant data were removed from the analysis. The descriptive statistics showed that the two classes had relatively similar mean scores before instruction. The experimental group obtained a pretest mean of 72.11, while the control group obtained a mean of 71.14. After instruction, the experimental group's mean increased to 95.11, representing a gain of 23.00 points. The control group also improved, but its mean increased only to 76.46, representing a gain of 5.32 points. The standard deviation in the experimental group decreased from 4.59 to 1.95, indicating that students' posttest scores were more closely clustered around the group mean.

Table 2. Descriptive Statistics of Students' Mini-Story Writing Scores

Group	Measurement	n	Minimum	Maximum	Mean	SD	Mean Gain
Experimental	Pretest	28	62	80	72.11	4.59	23.00
Experimental	Posttest	28	91	99	95.11	1.95	
Control	Pretest	28	61	78	71.14	4.38	5.32
Control	Posttest	28	71	81	76.46	2.70	

The distributions of the four sets of scores met the normality assumption. The Shapiro–Wilk significance values ranged from .315 to .593, all of which exceeded the .05 threshold. Levene's test also indicated homogeneous variances for the pretest and posttest scores, with significance values of .809 and .073, respectively. These findings supported the use of parametric tests for the subsequent comparisons.

Table 3. Results of the Normality and Homogeneity Tests

Assumption Test	Group or Measurement	Statistic	p	Interpretation
Shapiro–Wilk	Experimental pretest	.962	.381	Normal
Shapiro–Wilk	Experimental posttest	.970	.593	Normal
Shapiro–Wilk	Control pretest	.967	.499	Normal
Shapiro–Wilk	Control posttest	.958	.315	Normal
Levene's test	Pretest	.059	.809	Homogeneous
Levene's test	Posttest	3.352	.073	Homogeneous

The paired-samples test showed a statistically significant difference between the experimental group's pretest and posttest scores, $t(27) = -30.858$, $p < .001$. The null hypothesis of no improvement within the experimental group was therefore rejected. Students produced substantially higher writing scores after learning through the gamified application. The independent-samples test also showed a statistically significant difference between the posttest scores of the experimental and control groups, $t(54) = 29.612$, $p < .001$. Students who learned through the application achieved higher final writing scores than those who followed conventional instruction. The difference of 18.65 points between the posttest means was also consistent with the larger descriptive gain observed in the experimental group

Table 4. Results of the Inferential Tests of Mini-Story Writing Performance

Comparison	Statistical Test	t	df	p	Decision
Experimental pretest and posttest	Paired-samples <i>t</i> -test	-30.858	27	< .001	Significant
Experimental and control posttest	Independent-samples <i>t</i> -test	29.612	54	< .001	Significant

The improvement was not limited to numerical scores. Students' post-intervention stories contained more developed content, clearer beginning-middle-ending structures, more logical relationships between events, and a wider range of vocabulary. Their sentences were also clearer, while their ideas showed greater variation and creativity. These changes suggest that the intervention affected several dimensions of narrative composition rather than only increasing the amount of text written.

Table 5. Observed Changes in the Quality of Students' Mini-Stories

Writing Dimension	Before the Intervention	After the Intervention
Content	Brief and minimally developed	More detailed and developed
Story structure	Some narrative elements were incomplete	More complete beginning, middle, and ending
Coherence	Events were not always logically connected	Ideas and events were more logically sequenced
Vocabulary	Limited word choices	More varied vocabulary

Sentence accuracy	Predominantly simple and occasionally unclear sentences	Clearer and more effective sentences
Creativity	Ideas showed limited variation	Ideas were more varied and developed

Classroom observation further showed that most students remained involved throughout the application-based lesson. After the initial orientation, they were generally able to follow the sequence of reading, completing missions, and composing a mini-story. Students appeared interested in the tasks and completed the learning sequence by the end of the session. The teacher intervened mainly when students needed help understanding instructions or encountered technical difficulties. The implementation was supported by the availability of the computer laboratory, functioning devices, accessible internet service, prepared learning materials, and teacher assistance. The main difficulty occurred at the beginning of the session, when several students needed help logging in and identifying the correct order of activities. Once these procedures had been explained, the students continued the lesson without substantial technical disruption.

Discussion

The central finding of this study is that the gamified Baca dan Tulis Cerita Mini application was associated with substantially greater improvement in elementary students' mini-story writing performance than conventional instruction. The experimental group's mean score increased by 23.00 points, compared with only 5.32 points in the control group, while the significant posttest difference indicates that the improvement was not merely a consequence of general classroom exposure. Conceptually, this finding suggests that the effectiveness of the intervention derived less from digitisation itself than from the way digital activities were organised around the transition from reading comprehension to written production. This interpretation is consistent with the integrated reading-writing perspective proposed by Kim and Zagata (2024), who emphasise that systematically connecting reading and writing can strengthen literacy development because students can draw on textual models when constructing their own responses. It also corresponds with Graham et al. (2024), who argue that effective writing instruction requires explicit support for planning, organising, developing, and revising written ideas rather than simply increasing opportunities to write. Thus, the present findings extend previous research by showing that a gamified environment can become pedagogically meaningful when its digital features are embedded within a coherent literacy sequence rather than functioning as an independent motivational supplement.

A particularly important implication of the findings is that the intervention appears to have reduced the conceptual distance between reading a model story and producing an original narrative. Students first encountered a short story, subsequently completed guided missions, and only then developed their own mini-stories, creating a progression from input, to guided processing, to independent production. Such sequencing is theoretically meaningful because elementary writers often possess greater receptive understanding than productive control; consequently, a model text can provide concrete representations of narrative structure, vocabulary, event sequencing, and sentence construction that students can adapt to their own writing. Simpson and Cremin (2022) similarly conceptualise children as both readers and writers, suggesting that literacy learning becomes more productive when students actively mobilise reading experiences during writing. The present result also aligns with Kim and Zagata (2024), whose integrated instructional approach demonstrates the value of deliberately connecting reading and writing rather than treating them as unrelated classroom competencies. Compared with studies that examine reading and writing as separate outcomes, this study therefore provides a more process-oriented explanation of writing improvement: students were not simply given more writing practice, but were provided with textual resources that could support the generation and organisation of their own ideas. The contribution is consequently conceptual as well as instructional, because it positions gamification as a mechanism for structuring an integrated literacy process rather than merely increasing students' enthusiasm.

The improvement across multiple dimensions of narrative writing further suggests that the intervention affected the quality of composition rather than simply increasing students' scores through superficial task completion. Following the intervention, students demonstrated more developed content, clearer beginning-middle-ending structures, stronger logical sequencing,

broader vocabulary, clearer sentences, and greater variation in ideas. This multidimensional improvement is important because writing competence is inherently composite and cannot be adequately represented by the quantity of words produced or by a single global judgement. Wang and Troia (2023) demonstrate that writing achievement is shaped by the interaction of instructional practices, student motivation, and classroom conditions, supporting the interpretation that improvement emerges when instruction simultaneously addresses cognitive and motivational dimensions of writing. Likewise, Graham et al. (2024) emphasise the importance of explicit instructional support for the development of coherent and purposeful written texts. The present findings therefore support the argument that structured digital scaffolding can influence several components of elementary narrative composition when activities are aligned with the actual subskills required for writing. In theoretical terms, the study extends the literature by suggesting that the instructional value of gamification should be evaluated through the competencies that its design helps students construct, rather than through engagement indicators alone.

The role of gamification provides a further explanation for why the experimental group achieved markedly stronger outcomes. The application incorporated missions, points, badges, progress indicators, and a leaderboard, thereby transforming the writing task into a sequence of visible and manageable stages. These mechanisms may have supported persistence by making progress more observable and reducing the psychological burden associated with confronting a blank page, particularly for young learners who are still developing independent writing routines. This interpretation is broadly consistent with Zeybek and Saygı (2024), who conclude that gamification can influence learning when game elements are appropriately matched to instructional purposes, and with Zhou (2024), who reports positive effects of digital game-based learning on aspects of language learning and learner participation. It also corresponds with the broader evidence synthesised by Gyedu et al. (2026), although that literature cautions that gamification effects depend on educational context and implementation rather than arising automatically from the presence of game mechanics. The present study consequently supports a more conditional interpretation of gamification: points and badges were probably not the direct cause of improved writing, but may have functioned as motivational and organisational supports within an already pedagogically structured reading-to-writing process.

This interpretation is strengthened by the observation that students remained engaged and were generally able to complete the instructional sequence after receiving initial guidance. The finding suggests that usability and teacher mediation were important enabling conditions, challenging an overly technology-centred interpretation in which the application is assumed to operate independently of classroom instruction. The teacher continued to facilitate the lesson, clarify instructions, and assist students with technical difficulties, while the application provided the structure through which students moved from reading to writing. This is consistent with Suartama et al. (2024), who emphasise the importance of instructional design in determining whether digital environments meaningfully support learning, and with Sulis (2022), who conceptualises engagement as a multidimensional phenomenon shaped by both immediate classroom activities and broader instructional conditions. It also supports the caution raised by Chen and Wang (2025) that gamified systems can produce undesirable learning orientations when game mechanics become disconnected from educational purposes. In this context, the absence of substantial disruption after the initial orientation indicates that the technology was most effective when functioning as an instructional scaffold under teacher supervision, rather than as a substitute for pedagogical interaction.

The findings also help explain why the present study produces stronger evidence than some earlier studies of gamified literacy media. Previous research has frequently demonstrated benefits in motivation, engagement, general academic performance, or reading ability, but fewer studies have directly examined the quality of narrative writing produced by young elementary learners within an integrated reading-to-writing intervention. Studies by Kalogiannakis et al. (2021), Kuswandi and Fadhli (2022), Jackson et al. (2022), and Nash and Brady (2022) collectively indicate that game-based learning can create interactive learning environments, but their findings do not necessarily establish that gamification improves the multidimensional quality of children's independent narrative composition. The present results therefore narrow an important empirical gap by linking gamified instructional design directly to a performance-based writing outcome. At the same time, the findings should not be interpreted as demonstrating that gamification is universally superior to conventional

instruction, because the intervention combined several components—model reading, guided missions, digital progression, teacher support, and independent writing. The most defensible conclusion is therefore that an integrated instructional package containing gamified elements can provide stronger writing outcomes under the conditions examined here. This distinction is theoretically important because it shifts the research question from “Does gamification work?” toward the more meaningful question of “Under what pedagogical configuration can gamification contribute to literacy development?”

Another significant finding is the reduction in score variability within the experimental group, with the standard deviation decreasing from 4.59 to 1.95 after the intervention. Although this pattern should be interpreted cautiously, it may indicate that the structured sequence provided a common pathway through which students with somewhat different starting levels could access the same narrative resources and writing processes. In conventional writing instruction, students may differ considerably in their ability to generate ideas, organise narratives, and determine how to begin a story, whereas guided digital missions can externalise part of that process and make the expected sequence more transparent. This interpretation is compatible with Wang and Troia’s (2023) emphasis on the interaction between instructional conditions and student characteristics in shaping writing achievement. Nevertheless, the reduced dispersion cannot by itself establish greater equity of learning because the study did not conduct subgroup analyses or examine individual trajectories. It is therefore more appropriate to regard the finding as preliminary evidence that structured scaffolding may have supported convergence in performance, rather than as definitive evidence of reduced achievement disparities. Future research involving larger and more heterogeneous samples should test whether this pattern is reproducible among students with different baseline writing abilities, learning profiles, and levels of digital familiarity.

Despite the positive findings, several contextual and methodological considerations qualify the interpretation and define the boundaries of the study’s contribution. The intervention was implemented in a single school, involved only 56 students, lasted for one instructional meeting, used intact non-randomised classes, and did not include a delayed posttest; moreover, the manuscript explicitly reports that no numerical inter-rater reliability coefficient was available for the writing rubric. These conditions mean that the observed gains should be interpreted as strong evidence of short-term instructional effectiveness within the study context rather than as definitive evidence of long-term causal effects across elementary populations. An alternative explanation is that the novelty of the digital environment, combined with intensive teacher attention during the first implementation, may have contributed to students’ heightened engagement and performance. Similarly, because both classes received the same topic and instructional duration but differed in learning medium, the results support the value of the experimental condition but cannot isolate the independent contribution of each individual game element. Nevertheless, these limitations do not negate the central finding; rather, they indicate that the intervention’s effectiveness should be understood as contingent upon pedagogical alignment, teacher facilitation, technological readiness, and sustained exposure. Future studies should therefore employ larger multi-school samples, randomised or matched designs where feasible, longer interventions, delayed assessments, dimension-specific statistical analysis, and stronger inter-rater reliability procedures to determine whether the observed advantages persist over time.

Taken together, the findings position the Baca dan Tulis Cerita Mini application within a broader international movement toward integrated, technology-supported literacy instruction while offering a context-specific contribution from Indonesian elementary education. The study demonstrates that digital gamification becomes educationally consequential when it is deliberately connected to the cognitive progression from reading, to interpreting, to organising ideas, and finally to independent writing. This conclusion complements the literature on integrated literacy instruction (Kim & Zagata, 2024; Graham et al., 2024), while refining the gamification literature by showing that game mechanics can support writing development when they are embedded within meaningful instructional stages rather than added as decorative rewards. Theoretically, the study therefore extends the reading-to-writing perspective by illustrating how a digital environment can operationalise the transition between receptive and productive literacy processes, while also qualifying gamification theory through an emphasis on pedagogical alignment and teacher mediation. Practically, the findings suggest that elementary teachers and educational technology

developers should prioritise instructional sequencing, accessible narrative models, guided composition, and meaningful progress structures rather than simply increasing the number of game elements. More broadly, the study fills a contextual gap in the literature by providing comparative evidence that a locally developed gamified application can support multidimensional narrative writing outcomes among Indonesian elementary students, while also demonstrating that technology is most valuable when it strengthens not replaces the pedagogical processes through which children learn to become writers.

CONCLUSION

This study demonstrates that the gamified Baca dan Tulis Cerita Mini application can provide meaningful support for the development of mini-story writing skills among third-grade elementary students. Students who participated in the application-based learning showed a substantial improvement in their writing performance, with the mean score increasing from 72.11 in the pretest to 95.11 in the posttest, while the control group showed a more modest increase from 71.14 to 76.46. The statistical results confirmed a significant improvement within the experimental group and a significant difference in posttest performance between the experimental and control groups. Beyond the numerical results, students' writing demonstrated visible progress in content development, narrative structure, coherence, vocabulary selection, sentence accuracy, and creativity. These findings suggest that the strength of the application lies not simply in its game-based features, but in the way it connects reading a model story with guided activities and subsequent independent writing. The missions, points, badges, progress indicator, and leaderboard appeared to provide additional structure for students as they worked through the learning sequence, while teacher guidance remained important in helping students understand instructions and overcome initial technical difficulties. The study therefore contributes context-specific evidence that an integrated reading-to-writing approach supported by carefully aligned gamification can be a useful alternative for elementary writing instruction. Nevertheless, the findings should be interpreted within the conditions of the study, particularly its single-school setting, limited sample, one-session intervention, non-randomised class allocation, and absence of a numerical inter-rater reliability estimate for the writing rubric. Future research should examine the application across more diverse schools and longer instructional periods, include delayed assessments, strengthen writing-score reliability procedures, and investigate whether the observed benefits extend to other literacy outcomes. Within these boundaries, the evidence indicates that a well-structured digital learning environment can help young learners move more confidently from understanding a story to developing and expressing their own written narratives.

AUTHOR CONTRIBUTIONS STATEMENT

Barokah Widuroyekti contributed to the conceptualization of the study, development of the Indonesian language learning content, preparation of the mini-story writing activities, and drafting of the manuscript. Hadiqotul Luluk contributed to the design and implementation of the gamified learning application, integration of educational technology into the learning process, and evaluation of its classroom implementation. Arifin Nur Budiono contributed to the research methodology, development of the writing assessment instrument, measurement procedures, and interpretation of the findings from an educational psychology perspective. Yurike Kinanthi Karamoy conducted the statistical analysis, organised and interpreted the quantitative data, and prepared the presentation of the research findings. All authors, Barokah Widuroyekti, Hadiqotul Luluk, Arifin Nur Budiono, and Yurike Kinanthi Karamoy, contributed to reviewing and revising the manuscript and approved the final version for publication.

REFERENCES

- Alemi, M., Givi, S. S., & Rezanejad, A. (2022). The role of digital storytelling in EFL students' writing skill and motivation. *Language Teaching Research Quarterly*, 32, 16–35.
- Al-Khresheh, M. H. (2024). Bridging technology and pedagogy from a global lens: Teachers' perspectives on integrating ChatGPT in English language teaching. *Computers and Education: Artificial Intelligence*, 6, 100218. <https://doi.org/10.1016/j.caeai.2024.100218>
- Almufareh, M. (2021). The impact of gamification and individual differences on second language learning among first-year female university students in Saudi Arabia. *Simulation & Gaming*, 52(6), 715–734. <https://doi.org/10.1177/10468781211056511>
- Althobaiti, S., Rushton, A., Aldahas, A., Falla, D., & Heneghan, N. R. (2022). Practicable performance-based outcome measures of trunk muscle strength and their measurement properties: A systematic review and narrative synthesis. *PLOS ONE*, 17(6), e0270101. <https://doi.org/10.1371/journal.pone.0270101>
- Bakhtiari Moghadam, Z., Narafshan, M. H., & Tajadini, M. (2023). The effect of implementing a critical thinking intervention program on English language learners' critical thinking, reading comprehension, and classroom climate. *Asian-Pacific Journal of Second and Foreign Language Education*, 8(1), 15. <https://doi.org/10.1186/s40862-023-00188-3>
- Camacho, A., Alves, R. A., & Boscolo, P. (2021). Writing motivation in school: A systematic review of empirical research in the early twenty-first century. *Educational Psychology Review*, 33(1), 213–247. <https://doi.org/10.1007/s10648-020-09530-4>
- Chen, C., & Wang, Y.-Y. (2025). How gamification goes wrong: Understanding the maladaptive goal orientation in gamified learning systems. *Internet Research*, 36(2), 572–594. <https://doi.org/10.1108/INTR-07-2024-1111>
- Christensen, I. (2024). Understanding tradeoffs in the institutional design and leadership of collaborative governance. *Public Performance & Management Review*, 47(2), 263–290. <https://doi.org/10.1080/15309576.2023.2283583>
- Dahlström, H. (2022). Students as digital multimodal text designers: A study of resources, affordances, and experiences. *British Journal of Educational Technology*, 53(2), 391–407. <https://doi.org/10.1111/bjet.13171>
- Gadke, D. L., Kratochwill, T. R., & Gettinger, M. (2021). Incorporating feasibility protocols in intervention research. *Journal of School Psychology*, 84, 1–18. <https://doi.org/10.1016/j.jsp.2020.11.004>
- Ghafouri, M., Hassaskhah, J., & Mahdavi-Zafarghandi, A. (2024). From virtual assistant to writing mentor: Exploring the impact of a ChatGPT-based writing instruction protocol on EFL teachers' self-efficacy and learners' writing skill. *Language Teaching Research*. <https://doi.org/10.1177/13621688241239764>
- Graham, S., Collins, A. A., & Ciullo, S. (2024). Evidence-based recommendations for teaching writing. *Education 3-13*, 52(7), 979–992. <https://doi.org/10.1080/03004279.2024.2357893>
- Gyedu, F. O., Partey, P. A., Bofo, F. A., & Agbo, D. D. (2026). Gamification effect: Enhancing student learning outcomes in higher education: A meta-analysis and policy implications. *SAGE Open*, 16(1), 21582440261421375. <https://doi.org/10.1177/21582440261421375>
- Jackson, L. C., O'Mara, J., Moss, J., & Jackson, A. C. (2022). Analysing digital educational games with the Games as Action, Games as Text framework. *Computers & Education*, 183, 104500. <https://doi.org/10.1016/j.compedu.2022.104500>
- Jusslin, S., & Höglund, H. (2021). Entanglements of dance/poetry: Creative dance in students' poetry reading and writing. *Research in Dance Education*, 22(3), 250–268. <https://doi.org/10.1080/14647893.2020.1789088>
- Kalogiannakis, M., Papadakis, S., & Zourmpakis, A.-I. (2021). Gamification in science education: A systematic review of the literature. *Education Sciences*, 11(1), 22. <https://doi.org/10.3390/educsci11010022>

- Kim, Y.-S. G., & Zagata, E. (2024). Enhancing reading and writing skills through systematically integrated instruction. *The Reading Teacher*, 77(6), 787–799. <https://doi.org/10.1002/trtr.2307>
- Kiryakova, G. (2022). Engaging learning content for digital learners. *TEM Journal*, 11(4), 1958–1964.
- Kuswandi, D., & Fadhli, M. (2022). The effects of gamification method and cognitive style on children's early reading ability. *Cogent Education*, 9(1), 2145809. <https://doi.org/10.1080/2331186X.2022.2145809>
- Li, M., & Wilson, J. (2025). AI-integrated scaffolding to enhance agency and creativity in K-12 English language learners: A systematic review. *Information*, 16(7), 519. <https://doi.org/10.3390/info16070519>
- Liman Kaban, A., & Karadeniz, S. (2021). Children's reading comprehension and motivation on screen versus on paper. *SAGE Open*, 11(1), 2158244020988849. <https://doi.org/10.1177/2158244020988849>
- Mergen, M., Graf, N., & Meyerheim, M. (2024). Reviewing the current state of virtual reality integration in medical education—A scoping review. *BMC Medical Education*, 24(1), 788. <https://doi.org/10.1186/s12909-024-05777-5>
- Nash, B. L., & Brady, R. B. (2022). Video games in the secondary English language arts classroom: A state-of-the-art review of the literature. *Reading Research Quarterly*, 57(3), 957–981. <https://doi.org/10.1002/rrq.454>
- Ruiz-Rojas, L. I., Acosta-Vargas, P., De-Moreta-Llovet, J., & Gonzalez-Rodriguez, M. (2023). Empowering education with generative artificial intelligence tools: Approach with an instructional design matrix. *Sustainability*, 15(15), 11524. <https://doi.org/10.3390/su151511524>
- Simpson, A., & Cremin, T. M. (2022). Responsible reading: Children's literature and social justice. *Education Sciences*, 12(4), 264. <https://doi.org/10.3390/educsci12040264>
- Suartama, I. K., Yasa, I. N., & Triwahyuni, E. (2024). Instructional design models for pervasive learning environment: Bridging formal and informal learning in collaborative social learning. *Education Sciences*, 14(12), 1405. <https://doi.org/10.3390/educsci14121405>
- Sulis, G. (2022). Engagement in the foreign language classroom: Micro and macro perspectives. *System*, 110, 102902. <https://doi.org/10.1016/j.system.2022.102902>
- Thompson, J., & Childers, G. (2021). The impact of learning to code on elementary students' writing skills. *Computers & Education*, 175, 104336. <https://doi.org/10.1016/j.compedu.2021.104336>
- Veddayana, C., Suyitno, I., Widyartono, D., & Aldresti, F. (2025). Systematic review: How technology supports collaborative writing learning in higher education. *Electronic Journal of E-Learning*, 23(3), 64–78.
- Wang, H., & Troia, G. A. (2023). How students' writing motivation, teachers' personal and professional attributes, and writing instruction impact student writing achievement: A two-level hierarchical linear modeling study. *Frontiers in Psychology*, 14. <https://doi.org/10.3389/fpsyg.2023.1213929>
- Zeybek, N., & Saygi, E. (2024). Gamification in education: Why, where, when, and how?—A systematic review. *Games and Culture*, 19(2), 237–264. <https://doi.org/10.1177/15554120231158625>
- Zhou, S. (2024). Gamifying language education: The impact of digital game-based learning on Chinese EFL learners. *Humanities and Social Sciences Communications*, 11(1), 1518. <https://doi.org/10.1057/s41599-024-04073-3>