

Enhancing Elementary Students' Literacy Engagement through a Web-Based Digital Literature Platform: A Mixed-Methods Study and Instructional Framework

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Abstract

The increasing integration of digital and multimodal texts underscores the need for more empirical research at the elementary level on how pedagogically designed platforms enhance literacy engagement. To address this gap, this study examined the effectiveness of a web-based digital literature platform in fostering elementary students' literacy engagement through pedagogically mediated instruction. An explanatory sequential mixed-methods design was employed involving 30 elementary students who participated in an eight-week instructional intervention. Quantitative data were collected using pre- and post-tests measuring cognitive, affective, and behavioral engagement, as well as students' abilities to identify key information, analyze intrinsic literary elements, and interpret moral and social meanings in visual and audiovisual texts. Qualitative data from classroom observations, focus group discussions, and teacher interviews were used to elaborate on the quantitative findings. Results showed statistically significant improvements in literacy engagement and multimodal literary literacy. Qualitative evidence indicated that guided multimodal scaffolding, analytical prompts, and reflective activities supported students' progression from a surface-level understanding to an evidence-based interpretation. Based on integrated findings, the study proposes a four-phase instructional framework comprising Engagement, Analysis, Interpretation, and Reflection, offering transferable principles for elementary digital literacy instruction.

Keywords:

digital literature platform; instructional framework; literacy engagement; multimodal literacy; web-based learning



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Introduction

The rapid development of digital technologies has significantly transformed students' literacy practices, shifting from the dominance of print-based texts toward engagement with multimodal texts that integrate visual, audiovisual, and interactive elements (Gnams, 2025; Ylipulli et al., 2023). Within this context, twenty-first-century literacy extends beyond traditional decoding and literal

comprehension. It now encompasses more complex analytical competencies that are essential for students to navigate contemporary texts. These competencies include identifying key information, analyzing intrinsic literary elements (such as theme, plot, and setting), and interpreting moral and social meanings in reflective and argumentative ways (Calafato & Simmonds, 2022; Fradana et al., 2025; Gasser et al., 2025; Walldén & Winlund, 2025).

However, empirical evidence from elementary literature classrooms reveals a substantial gap between curricular expectations and classroom realities (Muzakkir, Saptarina, & Amelia, 2022; Nawi, Syafiq, Nor, & Amani, 2023). Achievement in visual and audiovisual literary literacy remains relatively low, particularly in terms of student engagement and analytical competence (Dahiru, 2020; Najeeb & Jameel, 2024). Classroom observations indicate that many students struggle to identify key information in short audiovisual texts, analyze the intrinsic elements of visual narratives holistically, or formulate logical, evidence-based moral interpretations (Baker et al., 2023; Encabo-Fernández, Albarracín-Vivo, & Jerez-Martínez, 2023). Teachers report that students tend to focus on surface-level visual features—such as color, animation, and character expressions—while structured visual literacy strategies are not yet systematically embedded in instructional planning (Dey & Munshi, 2025; Eryilmaz & Çelik, 2025). At the same time, students often perceive visual narratives primarily as entertainment rather than as objects of critical inquiry, leading to a weak conceptual understanding of literary themes and messages (Gacumo, Coats, & Kucirkova, 2026; Sakanti & Widodo, 2020; Volker Pietsch, 2024).

These difficulties are further evident in students' analytical tasks and classroom discussions. When asked to identify themes, plots, and settings, most students provide fragmented keywords without explaining relationships among elements or supporting their interpretations with multimodal evidence. Classroom discussions rarely reach deeper levels of inquiry and seldom explore multimodal elements such as imagery, background music, point of view, or symbolism. Consequently, instructional goals emphasizing comprehension of literary content, structure, and meaning are not optimally achieved (Najeeb & Jameel, 2024). From an affective and reflective perspective, students tend to recognize only surface-level moral values (e.g., "honesty" or "kindness") without connecting them to broader social and cultural contexts or engaging in ethical reflection through discussion (Muzakkir et al., 2022; Najeeb & Jameel, 2024).

Low achievement in articulating moral, social, and cultural values in literary texts has also been reported in previous studies (Dahiru, 2020). Assessment results

show that students rarely integrate multimodal evidence into value interpretation, while reflective activities and critical discussions remain limited. These conditions are exacerbated by constraints in technological resources, limited teacher training, and the absence of pedagogically grounded multimodal task designs and assessment frameworks (Brosseuk & Downes, 2024; Gil-Flores, Rodríguez-Santero, & Torres-Gordillo, 2017; Hew & Brush, 2007; Nawi et al., 2023).

At the same time, global literacy practices are increasingly oriented toward digital and multimodal forms (Ho, 2024; Kress, 2003). In language and literature education, Digital Multimodal Composing (DMC)—which integrates textual, audio, visual, spatial, and kinetic elements—has gained attention as a pedagogical approach aligned with students' contemporary media cultures (Kessler & Marino, 2023; Sahiruddin, Sudarwati, Lestari, & Daniswara, 2025). Empirical studies indicate that consistent integration of digital multimodal practices can enhance the quality of students' writing in terms of content, organization, and communicative achievement (Maghsoudi, Golshan, & Naeimi, 2022). Nevertheless, empirical and design-based research focusing specifically on elementary students remains limited, particularly studies that test effectiveness using systematic, experimental approaches (Jiang & Hafner, 2025; Mayer, 2024).

These conditions highlight a critical gap between curriculum demands for analytical and reflective literary literacy and classroom practices that still position digital media primarily as playback tools, without structured support for higher-order thinking (Farrar, Arizpe, & Lees, 2024; Mayer, 2024). Such pedagogical insufficiency constrains students' conceptual development, especially in understanding literary themes and constructing moral arguments, thereby impeding the early development of literary reasoning and critical thinking. This issue is particularly salient in visual and audiovisual literacy, given the growing importance of interpreting and evaluating meaning in complex digital media environments as a core twenty-first-century competence (Farrar et al., 2024).

In response to this gap, the present study underscores the urgency of developing pedagogically designed web-based digital literature platforms that facilitate students' cognitive, affective, and behavioral engagement in visual and audiovisual literary learning. Employing a mixed-methods approach, the study examines the platform's effectiveness quantitatively while qualitatively exploring teachers' and students' experiences to achieve a comprehensive understanding of its pedagogical impact.

The novelty of this study lies in: (1) the development of a web-based digital literature platform integrated with

multimodal analytical, interpretative, and reflective tasks; (2) the provision of mixed-methods empirical evidence on the platform's effects on elementary students' literacy engagement; and (3) the formulation of an applicable instructional framework to guide the implementation of digital literary learning in classroom contexts. Accordingly, this study contributes to strengthening evidence-based, sustainable, and pedagogically grounded digital literary practices for improving the quality of elementary literature education in the digital era.

In light of the identified gap between the demands of multimodal literary literacy and current instructional practices in elementary classrooms, this study examines the pedagogical effectiveness of a web-based digital literature platform designed to support structured engagement and higher-order literary meaning-making. Employing an explanatory sequential mixed-methods approach, the study investigates both the outcomes and the instructional processes underlying students' engagement and multimodal literary literacy development. Accordingly, the following research questions guide the study:

RQ 1: Does the use of a pedagogically designed web-based digital literature platform significantly affect elementary students' literacy engagement across cognitive, affective, and behavioral dimensions compared with conventional literature instruction?

RQ 2: Does the use of the platform significantly improve elementary students' multimodal literary literacy in terms of: (a) identifying key information, (b) analyzing intrinsic elements of visual and audiovisual literary texts, and (c) interpreting moral and social meanings in argumentative and reflective ways?

RQ 3: How do students' and teachers' experiences and perceptions explain changes in literacy engagement and analytical literary competence following the use of the web-based digital literature platform?

RQ 4: How do the students utilize multimodal features and tasks within the platform to construct analytical, interpretative, and reflective understandings of visual and audiovisual literary texts?

RQ 5: How can quantitative results and qualitative findings be integrated to formulate an applicable web-based multimodal digital literature instructional framework for elementary education?

Literature Review

Multimodal Digital Literacy and the Challenge of Student Engagement

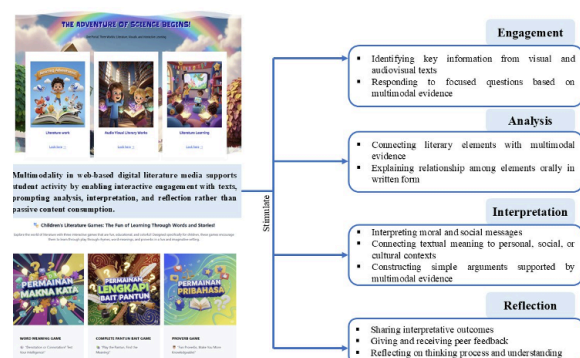
Contemporary literacy practices have shifted from print-dominated texts toward multimodal digital

literacy that integrates verbal, visual, auditory, spatial, and interactive modes (Beltrán-Palanques, 2024; Brosseuk & Downes, 2024; Lim & Kessler, 2024). This transformation necessitates reconceptualizing literacy engagement as a multidimensional construct encompassing cognitive, affective, and behavioral involvement, rather than as passive text consumption. Within the Digital Multimodal Composing (DMC) framework, learners are positioned as active meaning-makers who design and orchestrate multiple semiotic resources to construct meaning, rendering literacy a participatory and reflective process of meaning-making rather than mere skill acquisition (Jiang & Hafner, 2025).

Despite growing interest in multimodal literacy (i.e., the capacity to construct meaning by integrating and orchestrating diverse semiotic resources including images, text, sound, and gesture; see Jewitt, C. and Kress (2003), Mills & Unsworth (2017), and Walsh (2010), recent reviews highlight a persistent gap between digital platform design, instructional practices, and empirically measured literacy engagement outcomes. Much of the existing research remains descriptive and product-oriented, focusing on multimodal artifacts rather than examining how web-based platform features, task structures, and user interactions function pedagogically to foster engagement (J. Lim & Kessler, 2024; Rahmanu & Molnár, 2024). Consequently, there is a need for research that systematically integrates quantitative and qualitative evidence to examine both the effects and mechanisms of engagement within web-based digital literature platforms. Figure 1 presents a pedagogical framework of how multimodal features in a web-based digital literature platform stimulate student engagement. These features activate student-centered activities such as multimodal evidence identification, analytical reasoning, interpretative meaning-making, and reflective interaction.

Figure 1.

Multimodal web-based digital literature media support student engagement by promoting active student participation across engagement, analysis, interpretation, and reflection.



Effectiveness of Digital Platforms and Digital Multimodal Composing

Empirical studies over the past three years suggest that digital platforms and DMC practices can enhance students' literacy engagement and learning outcomes when supported by intentional pedagogical design. Comparative and quasi-experimental research indicates that students involved in multimodal composing demonstrate improved organization, coherence, and rhetorical quality in literacy tasks alongside higher levels of engagement, particularly when reflection on design choices and meaning-making is embedded in instruction (Abdelhalim, 2024; Ho, 2024; Yu et al., 2024).

However, these benefits are not automatic. Without explicit scaffolding, analytical prompting, and structured reflection, digital platforms tend to promote surface-level engagement centered on visual appeal rather than deeper literary analysis (Nurjain, Nurjain, Fajriah, Nurjain, & Firdaus, 2026). This limitation is especially pronounced in elementary contexts, where students require guided support to move from multimodal exposure toward analytical, interpretative, and reflective literacy practices (Susilowaty, Setyarini, & Gustine, 2025). Accordingly, web-based digital literature platforms should be conceptualized not merely as technological tools but as pedagogically mediated instructional environments that deliberately integrate multimodal tasks and progressive scaffolding to support meaningful engagement (Deshmukh & Thakur, 2025).

Pedagogical Design as a Mediator of Multimodal Literacy Engagement

Multimodal literacy theory emphasizes that meaning is constructed through the orchestration of multiple semiotic modes, underscoring the importance of pedagogical designs that make these processes explicit to learners (Brosseau & Downes, 2024; J. Lim & Kessler, 2024). Research consistently demonstrates that literacy engagement increases when students are guided to analyze relationships among visual, textual, and auditory elements and to justify interpretations using multimodal evidence (Lim et al., 2022; Lim & Unsworth, 2023; Midgette et al., 2025). In web-based learning environments, features such as digital annotation, guided prompts, and collaborative discussion spaces are practical only when aligned with clear instructional goals and supported by pedagogical mediation (Ho, 2024).

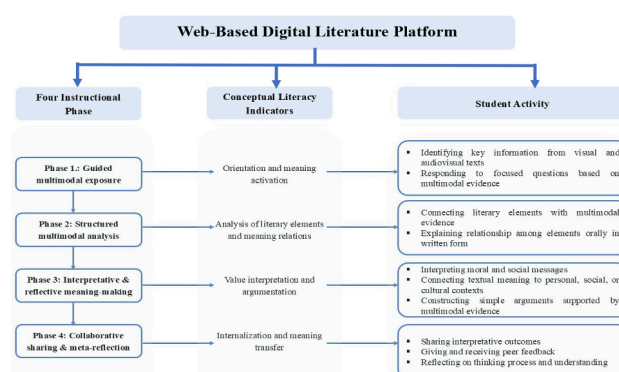
Despite these insights, intervention-based research at the elementary level remains limited, with most empirical studies concentrating on secondary or tertiary education and relying heavily on descriptive or perception-based approaches (Jiang & Hafner, 2025). This gap is particularly consequential given that

elementary education represents a critical phase for the development of literacy engagement, narrative reasoning, and affective responses to multimodal texts (Gacumo et al., 2026; Papen & Peach, 2021). Addressing this limitation, the present study adopts an explanatory sequential mixed-methods design to examine the effects of a pedagogically designed web-based digital literature platform on elementary students' literacy engagement and multimodal literary literacy, while explicating the instructional mechanisms underlying these effects. By integrating outcome-based and process-oriented evidence, this study contributes an applicable instructional framework that clarifies how multimodal digital platforms can be systematically leveraged to foster analytical, interpretative, and reflective literary learning in elementary education (Aloizou, Ioannou, Boloudakis, & Retalis, 2025).

An instructional framework for a web-based digital literature platform illustrating the alignment among four instructional phases, conceptual literacy indicators, and student-centered activities. The framework demonstrates how guided multimodal exposure, structured multimodal analysis, interpretative and reflective meaning-making, and collaborative sharing progressively activate students' cognitive, affective, and behavioral engagement through the identification of multimodal evidence, analytical reasoning, interpretation of moral and social meanings, and reflective interaction (Figure 2).

Figure 2.

Presents the instructional framework developed from the integrated findings of this study. The framework illustrates how multimodal features activate student engagement through four phased student-centered activities: Engagement, Analysis, Interpretation, and Reflection



Method

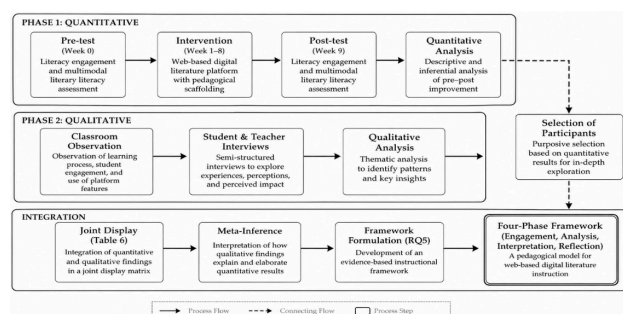
Research Design

This study employed a sequential explanatory mixed-methods design, consisting of two phases: (1) quantitative data collection and analysis to examine the effects of the intervention, followed by (2) qualitative data collection and analysis to explain and

contextualize the quantitative results (Creswell & Clark, 2018). This design was selected for three main reasons. First, the study aimed to measure the effectiveness of the web-based digital literature platform on students' literacy engagement and multimodal literacy literacy, which required quantitative pre- and post-test comparisons to establish statistical evidence of improvement. Second, beyond measuring effectiveness, the study sought to understand how and why the platform produced its effects, which required qualitative exploration of participants' experiences, perceptions, and learning processes. Third, the explanatory sequential design allowed the qualitative findings to elaborate on and explain the quantitative results, providing a more comprehensive and nuanced understanding than either approach could achieve alone (Creswell & Clark, 2018). This design is widely recommended for educational intervention research as it enables researchers to evaluate effectiveness while simultaneously exploring participants' experiences and learning processes (Habibullah et al., 2025).

Figure 3.

Illustrates the sequential phases of the research design, showing the flow from quantitative data collection and analysis to qualitative data collection and analysis, followed by interpretation and integration of both data strands.



Population and Sample

The population comprised fourth-grade students in Bangka Belitung, Indonesia, who were heterogeneous with respect to gender, digital literacy experience, and access to technology. Such heterogeneity was considered a methodological strength, as it enhances ecological validity and reflects real classroom diversity, which has been shown to influence learning outcomes and instructional effectiveness (Decristan, Fauth, Kunter, Büttner, & Klieme, 2017; Gabaldón-Estevan, 2020). Furthermore, in the context of digital literacy, which has been shown to influence elementary students' learning outcomes, a heterogeneous population allows for assessment of how variability in literacy and access affects educational outcomes (Wulandari & Aslam, 2022).

Participants (N = 30) were selected from a fourth-grade classroom at a public elementary school

in Bangka Belitung, Indonesia. The school was selected purposively based on accessibility and the principal's willingness to participate in the eight-week intervention study. The participating class was chosen to reflect typical classroom diversity in terms of gender, digital literacy experience, and access to technology. While this sampling strategy does not permit statistical generalization to the broader population, it was sufficient to examine within-group changes and to generate explanatory qualitative insights that illuminate observed quantitative patterns. The use of a single intact class is common in school-based intervention research where instruction is delivered at the classroom level, as it minimizes instructional contamination and enhances pedagogical authenticity (Cochran, 1977; Kish, 1965). This sampling strategy minimizes instructional contamination and aligns with classroom-based designs that prioritize instructional feasibility and pedagogical authenticity. While not intended for statistical generalization, the sample size was sufficient to examine within-group changes and to generate explanatory qualitative insights that illuminate observed quantitative patterns.

Data collection tools

Classroom observations were conducted to capture key indicators of literacy engagement and instructional practices. The observation protocol focused on five dimensions: (a) student engagement (cognitive, affective, and behavioral indicators), (b) student-teacher interaction, (c) use of digital tools and platform features, (d) collaborative behavior among students, and (e) evidence of multimodal literacy strategies (e.g., use of visual and audio evidence, analytical reasoning).

Observation

Observations were conducted by two trained research assistants who were not involved in the instructional intervention to minimize potential bias. Prior to the observation period, both assistants underwent a four-hour training session that covered: (1) familiarization with the observation protocol and operationalized indicators, (2) practice coding using video recordings of pilot lessons, and (3) discussion of discrepancies to achieve inter-rater reliability. Inter-rater reliability was established with a Cohen's kappa coefficient of 0.85, indicating substantial agreement (Landis & Koch, 1977).

Each classroom session was observed twice weekly over the eight-week intervention period, resulting in a total of 16 observation sessions per class. Each observation lasted for the full duration of the 70-minute lesson. Observations were conducted in real-time using a structured observation sheet with binary scoring (implemented = 1; not implemented = 0) for each indicator, supported by brief descriptive notes to capture contextual details and notable incidents (Chi

& Wylie, 2014; Fredricks et al., 2004; Guimarães & Lima, 2021; Hsiao et al., 2022). To ensure consistency, both observers conducted observations independently during the first two sessions, and any discrepancies were discussed and resolved before continuing with subsequent sessions. The observers were instructed to remain as unobtrusive as possible and to avoid any interaction with students or the teacher during the lessons.

Semi-structured

Semi-structured interviews were employed to explore students’ learning experiences, affective responses, and perceived challenges, as well as teachers’ perspectives on implementation and pedagogical implications. To capture both individual and shared perspectives, two types of interviews were conducted: (1) individual semi-structured interviews with teachers (n = 2) and (2) focus group discussions (FGDs) with students.

The focus group discussions were chosen as the primary method for student data collection for several reasons. First, the interactive nature of focus groups encourages students to build upon each other’s ideas, generating richer and more nuanced insights than individual interviews alone (Krueger & Casey, 2015). Second, since students shared the same classroom experience during the eight-week intervention, the group setting facilitated collective reflection and recall of shared learning events. Third, focus groups are considered developmentally appropriate for elementary students, as they reduce the potential anxiety associated with one-on-one interviews and allow children to feel more comfortable expressing their views in a peer-supported environment (Morgan, 1996)

A total of four focus group discussions were conducted, with each group consisting of five to six students (N = 20). Students were purposively selected to reflect variation in gender, digital literacy experience, and access to technology, ensuring

depth and diversity of qualitative insights (Ahmad & Wilkins, 2025; Jackson et al., 2024). Each FGD session lasted approximately 30-40 minutes and was guided by a semi-structured interview protocol covering students’ engagement experiences, use of platform features, challenges encountered, and perceived learning gains. Additionally, individual interviews were conducted with the two classroom teachers to explore their perspectives on implementation feasibility, pedagogical strategies, and observed changes in student learning. All interviews and FGDs were audio-recorded, transcribed verbatim, and analyzed thematically.

Test

The achievement test was developed to measure students’ multimodal literary literacy, covering three main areas: identifying key information, analyzing intrinsic literary elements, and interpreting moral and social meanings. The test comprised 12 multiple-choice items, which were then validated through expert review and pilot testing as described below. Test items underwent expert review by specialists in literacy and elementary education to establish content validity, followed by minor revisions to improve clarity and communicative appropriateness. Based on expert judgment, 87% of the items (10 out of 12) were deemed ready for use. The remaining two items were identified as having construct validity issues. For instance, one item asked students to determine “what occurs at the conclusion of the tale” with response options that were vague, interpretive, and not mutually exclusive. Such item-writing flaws reduce the ability of items to accurately measure the intended construct (Rezigalla et al., 2024; Sajjad, Iltaf, & Khan, 2020). These items were therefore excluded from the final instrument. Subsequently, an empirical pilot test was conducted with 34 elementary students. Item validity was examined using Pearson’s correlation ($r_{\text{calculated}} > r_{\text{table}}$, $\alpha = .05$, $df = 32$), while internal consistency reliability was assessed using Cronbach’s alpha (Anselmi et al., 2019) in SPSS. Validation results are reported in Table 1.

Table 1.
Validation test results using Pearson correlation

Main Topic	Students’ Engagement in Literary Literacy Activities	Item	r_{table}	r_{count}	Sig	Decision
Analyzing information from various types of texts, as well as the values embedded in literary texts derived from visual and/or audiovisual materials	Identifying key information from a literary text	Item 1	.349	.482**	.000	Valid
		Item 2	.349	.471**	.000	Valid
		Item 3	.349	.234*	.023	Invalid
	Determining the story content, theme, plot, setting, and characters of literary texts	Item 4	.349	.370**	.000	Valid
		Item 5	.349	.451**	.000	Valid
		Item 6	.349	.554**	.000	Valid
		Item 7	.349	.369**	.000	Valid
	Articulating the moral, social, or cultural values embedded in literary texts	Item 8	.349	.524**	.000	Valid
		Item 9	.349	.117	.258	Invalid
		Item 10	.349	.553**	.000	Valid
	Concluding the messages or values conveyed in literary texts	Item 11	.349	.440**	.000	Valid
		Item 12	.349	.691**	.000	Valid

Table 1 shows that 10 items were valid and two were invalid. The test demonstrated high reliability (Cronbach's $\alpha = 0.913$). Based on these results, 10 representative items were selected to measure students' engagement in literary activities, with consideration given to balancing test duration with elementary students' attention span to ensure fairness and accurate responses (Chan, Zhang, & Oon, 2023; Rençber & Genç, 2024). The selected items were representative in principle, ensuring that all subtopics and indicators were covered proportionally while avoiding redundancy within any single indicator (Ryoo, Park, Suh, Choi, & Kwon, 2022).

Test structure

Examples of test items that were not selected in the measurement instrument because they were already represented in other items are:

Test number	: 3
Sub-topic	: Information from various types of texts
Students' Engagement in Literary Literacy Activities Indicator	: Identifying key information from a literary text
Item test	: What occurs at the conclusion of the tale Putri Tanjuk Malam? a. She departs for an idyllic and peaceful place. b. The villagers experience profound sorrow. c. The ending remains highly ambiguous and enigmatic. d. All of the provided options may be considered plausible.

The item was determined to be constructively invalid due to several substantive deficiencies. First, the question is ambiguous and insufficiently specific, as it does not direct respondents to any verifiable textual element such as the final event, the protagonist's last action, or a concrete narrative consequence. This lack of specificity prevents the item from accurately eliciting the intended cognitive process. In addition, the answer choices fail to reference explicit textual details; instead, they rely on vague or interpretive descriptors that do not require students to retrieve evidence from the source text. The item also violates the principle of mutually exclusive response options, as option (d) implies that all alternatives may be correct, thereby undermining the item's discriminative capacity and increasing the probability of random guessing. Most critically, the item does not measure the intended construct—identifying key information in a literary text—and instead prompts broad interpretive judgments. Collectively, these flaws indicate that the item lacks construct validity and is therefore unsuitable

for assessing the targeted aspect of literary literacy (Rezigalla et al., 2024). Item-writing flaws lower test quality and reduce the ability of items to differentiate participants based on their mastery of the material (Sajjad et al., 2020).

Data analysis

The normality of the data was examined using the Shapiro–Wilk test. The results showed that both pre-test ($p = .033$) and post-test ($p = .000$) scores violated the normality assumption ($\alpha = .05$). Therefore, the non-parametric Wilcoxon signed-rank test was employed to compare pre- and post-test differences (Goss-Sampson, 2020; Mohammadi Zenouzagh et al., 2025). Effect sizes (Cohen's d) were calculated to estimate the practical magnitude of intervention effects and interpreted using established benchmarks (Lakens, 2022).

Before hypothesis testing, the data were examined for normality using the Shapiro–Wilk test. Given the relatively small sample size ($N = 30$), which is known to increase variability and sensitivity in normality testing (Gosselin, 2024; Souza, Toebe, Mello, & Bittencourt, 2022; Uhm & Yi, 2023), non-normal distributions were anticipated. Therefore, a nonparametric Wilcoxon signed-rank test was employed to examine pre- and post-test differences, as it does not require the assumption of normality (Goss-Sampson, 2020; Mohammadi Zenouzagh et al., 2025). Effect sizes (Cohen's d) were calculated to estimate the practical magnitude of intervention effects and interpreted using established benchmarks (Lakens, 2022).

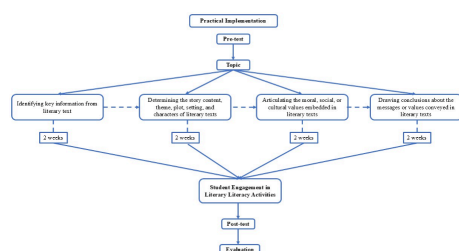
The qualitative phase aimed to explain quantitative outcomes. Structured classroom observations documented student engagement, teacher–student interaction, use of digital tools, and enactment of multimodal literacy strategies. Semi-structured interviews with purposively selected students and teachers explored learning experiences, perceived challenges, and meaning-making processes. Qualitative data were analyzed using thematic analysis and triangulated with quantitative results to strengthen explanatory validity.

Finally, interpretive integration combined statistical findings and qualitative themes to address the research questions and inform the development of an applicable instructional framework, consistent with explanatory sequential mixed-methods principles in educational research (Rezigalla et al., 2024).

Experimental Process

This study employed a mixed-methods sequential explanatory design, as illustrated in Figure 3.

Figure 3.
Experimental Process



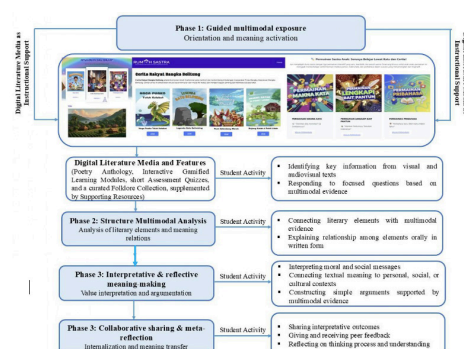
The experimental procedure began with a pre-test to assess students' baseline literacy before the intervention (Amumpuni, Hartono, Rukmini, & Haryanti, 2025). The instructional intervention was then implemented over eight weeks, structured into four sequential instructional phases, each lasting two weeks. These phases were designed to progressively develop core literary competencies, beginning with identifying key information in scholarly texts and culminating in concluding thematic, moral, and social meanings embedded in the texts (Kong, 2014; Puspitasari, Widiarti, & Subali, 2025)

The intervention emphasized both analytical processes—including identifying story content, theme, plot, setting, and characters—and interpretative processes, such as articulating moral, social, and cultural values, with the explicit aim of strengthening students' cognitive engagement in literary activities. Following the intervention, a post-test was administered to assess students' post-intervention literacy performance. Pre- and post-test data were subsequently analyzed to determine the significance of the intervention's learning gains.

Teaching Environment to Engage Students

The learning environment implemented in this study reflects a contemporary instructional approach that integrates web-based digital literature media to support multimodal, contextual, and participatory literary literacy, as illustrated in Figure 4.

Figure 4.
Environment to engage students



Digital media function not merely as content repositories but as instructional supports that provide access to literary texts, images, audio, animations, and interactive quizzes, thereby creating a multimodal, resource-rich, flexible, and accessible learning environment. The platform facilitates interaction between students and literary content, as well as teacher-student and peer interaction through gamified modules, quizzes, and collaborative tasks, which collectively enhance student engagement, motivation, and active participation (As Syafaatussalamah & Deandra Eka Salsabilla, 2025; Hardiyanti, Fitriani, & Ashari, 2023; Mohammadi Zenouzagh et al., 2025; Yuliana, Nirmala, & Ardiasih, 2023).

By incorporating locally grounded literary texts, the learning environment situates literary literacy within students' cultural contexts while leveraging digital affordances. This integrated environment—combining digital space, scholarly content, interaction, technology, and cultural relevance—demonstrates strong potential for enhancing student engagement and learning outcomes in the digital literacy era.

Result

This section presents the findings organized according to the five research questions. The results are reported sequentially, beginning with quantitative outcomes examining the effectiveness of the intervention (RQ1 and RQ2), followed by qualitative findings that explain the processes underlying these outcomes (RQ3 and RQ4), and concluding with the integration of both data strands to formulate an evidence-based instructional framework (RQ5). Quantitative data were analyzed using descriptive statistics and the Wilcoxon signed-rank test, while qualitative data from classroom observations, student interviews, and teacher interviews were analyzed.

Effect of the Web-Based Digital Literature Platform on Students' Literacy Engagement

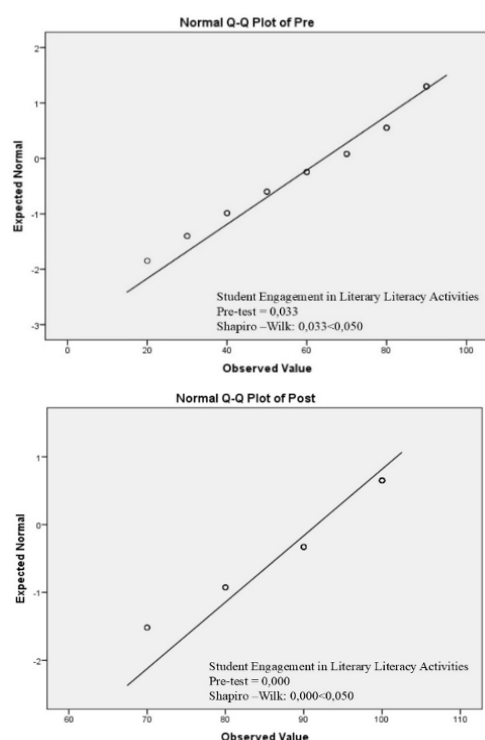
Before hypothesis testing, data were examined for normality using the Shapiro-Wilk test. The results indicated that student engagement scores were not normally distributed, with p-values of .033 for the pre-test and .000 for the post-test (Figure 5). As both values were below the $\alpha = .05$ threshold, the assumption of normality was not met.

The Wilcoxon test revealed a statistically significant increase in students' engagement in literary activities following the eight-week intervention using the web-based digital literature platform ($p < .001$). As shown in Table 2, the mean engagement score increased markedly from 64.33 (SD = 20.46) in the pre-test to 91.67 (SD = 10.20) in the post-test. The calculated effect size was considerable (Cohen's $d_z = 1.69$), substantially

exceeding the conventional benchmark for a significant effect ($d = 0.80$). This finding indicates that the intervention produced a strong and educationally meaningful impact on students' literacy engagement.

Figure 5.

Q-Q Plot of Pre-Post Test



Collectively, these results demonstrate that the pedagogically designed web-based digital literature platform significantly enhanced students' literacy engagement across cognitive, affective, and behavioral dimensions compared to their pre-intervention levels.

Perceptions and Responses in Multimodal Literacy Skills

To address RQ2, Table 3 synthesizes quantitative pre-post assessment outcomes and qualitative evidence from observations and interviews, providing a triangulated account of students' development in identifying key information, analyzing intrinsic elements, and interpreting moral and social meanings in multimodal literary texts.

The analysis demonstrates convergence across quantitative and qualitative data sources, indicating that assessment results, classroom observations, and participant perspectives consistently supported improvements in students' multimodal literacy skills. This triangulated evidence strengthens the validity of the findings related to RQ2 and provides a robust basis for subsequent integration with RQ1 and the development of the instructional framework (RQ5).

Students' and Teachers' Experiences and Perceptions of Literacy Engagement and Literary Analysis

To address RQ3, qualitative data from classroom observations and interviews with students and teachers were analyzed to explain the quantitative gains in literacy engagement (RQ1) and multimodal literacy skills (RQ2). Using an explanatory sequential mixed-methods approach, a thematic matrix was employed to triangulate data sources and elucidate how the web-based digital literature platform shaped students' engagement, analytical reasoning, and classroom literacy practices (Table 4).

As summarized in Table 4, students' and teachers' experiences provide a coherent explanatory account of the quantitative improvements observed in literacy engagement and multimodal literary literacy skills. Increased engagement functioned as a foundational mechanism that enabled focused attention, analytical processing, and reflective interpretation of multimodal literary texts. For instance, one student noted that "the pictures and animations make me want to follow the story until the end" (S2), while another explained that "the pictures help me understand what the story is about quickly" (S5). A teacher similarly confirmed that "students are significantly more attentive when digital media is used" (T1). The convergence of observational data and participant perspectives demonstrates that the web-based digital literature platform did not merely enhance motivation but systematically reshaped students' cognitive, affective, and interpretative literacy practices. Another student reflected on the interpretive dimension, stating that "the story reminds me of traditions in our village" (S7), indicating how the platform facilitated connections between literary texts and students' cultural contexts. A teacher also observed that "visuals helped students identify essential information more confidently" (T2), underscoring the platform's role in supporting analytical competence. These quotations illustrate how the platform transformed students from passive viewers to active meaning-makers, supporting the quantitative gains reported earlier.

Use of Multimodal Features to Build Literary Understanding

Building on the significant gains in literacy engagement (RQ1), multimodal literary literacy skills (RQ2), and students' and teachers' reported experiences (RQ3), this section examines how students actively utilized the multimodal features and pedagogical tasks embedded in the web-based digital literature platform. Qualitative evidence from classroom observations and interviews reveals that students' analytical, interpretative, and reflective understanding developed through purposeful interaction with specific platform affordances rather than through exposure to digital media alone.

Table 2.
The Result of the t-test through Wilcoxon

	N	Mean	Std. Deviation	Minimum	Maximum	t-test	Cohen's Effect
Pre	30	64.333	20.457	20.000	90.000	0.000	1.690
Post	30	91.667	10.1992	70.000	100.000		

Table 3.
Multimodal Literary Literacy Skills across Data Sources

RQ2 Indicator	Quantitative Evidence (Pre-Post Assessment)	Observation Data	Student Interview Excerpts	Teacher Interview Insights
Identifying key information	Increased accuracy in identifying central ideas and relevant events in post-test responses	Students focused on essential scenes rather than surface-level visuals	"Now I know which parts of the story are important."	"Students grasp the core ideas more quickly."
Analyzing intrinsic elements (theme, plot, setting)	Post-test responses demonstrated a more transparent structure and more logical sequencing	Students explained plot development and character actions coherently	"The plot is clearer when there are images and videos."	"They have started linking themes to events."
Interpreting moral and social meanings	Written responses showed greater depth and more vigorous justification	Students referred to visual and audiovisual cues during discussions	"The values are visible through the characters' actions."	"Students' answers are no longer limited to naming values."
Use of multimodal evidence	More frequent integration of visual and audio references	Students pointed to images, sounds, and scenes as supporting evidence	"The music helps me understand the mood."	"Students are beginning to use evidence from videos."
Level of literary reasoning	A shift from descriptive to analytical responses	Increased participation in interpretive discussions	"I can explain my reasons now."	"Classroom discussions have become more dynamic."

Table 4.
Students' and Teachers' Experiences and Perceptions of Literacy Engagement and Literary Analysis

Core Theme	Analytical Focus (Link to RQ1-RQ2)	Evidence from Classroom Observation	Evidence from Student Interviews	Evidence from Teacher Interviews
Increased engagement in multimodal literary activities	Engagement as a prerequisite for learning gains (RQ1)	Sustained attention during audiovisual sessions; reduced off-task behavior; increased participation	"The pictures and animations make me want to follow the story until the end."	"Students are significantly more attentive when digital media is used."
Improved identification of key information	Transition from engagement to cognitive processing (RQ2a)	Students used visual cues to identify main events more efficiently	"The pictures help me understand what the story is about quickly."	"Visuals helped students identify essential information more confidently."
Enhanced comprehension of literary elements (theme, plot, setting)	Development of analytical literary reasoning (RQ2b)	Coherent sequencing of plot; justified identification of themes using visual/audio cues	"I can understand the story because I see what happens next."	"Media provides contextual cues for deeper literary understanding."
Recognition of moral, social, and cultural values	Shift from analysis to reflective interpretation (RQ2c)	Students connected story events to local cultural contexts (Bangka Belitung)	"The story reminds me of traditions in our village."	"Local narratives made values feel personal and relevant."
Increased ability to draw logical conclusions	Emergence of evidence-based reasoning (RQ2c)	Students justified their interpretations using images and narrative audio	"I can show the part of the video that proves my answer."	"Visual evidence supports logical argumentation."
Positive affective response and learner confidence	Affective dimension sustaining engagement (RQ1)	Increased enthusiasm; voluntary participation; collaborative discussion	"I'm not afraid to give my opinion."	"Previously passive students became more confident."
Pedagogical affordances for teachers	Instructional mediation and scaffolding	Structured prompts guided discussions	—	"The platform reduces explanation time and improves clarity."
Technical and implementation challenges	Critical reflection on feasibility and scalability	Occasional connectivity issues; need for navigation support	"Sometimes the video loads slowly."	"Limited devices slow group progress."

As summarized in Table 5, students' analytical, interpretative, and reflective understanding emerged through purposeful interaction with specific multimodal features and pedagogical tasks. These affordances served as instructional scaffolds, transforming increased engagement (RQ1) into higher-order multimodal literary literacy (RQ2), as further explained by students' and teachers' experiences (RQ3).

Integration of Quantitative and Qualitative Findings

Table 6 presents the integrated findings addressing RQ5 through triangulation and thematic analysis.

The table functions as a joint display that synthesizes quantitative evidence (RQ1–RQ2) and qualitative insights (RQ3–RQ4) by aligning literacy stages, instructional phases, instructional inputs and designs, emergent thematic categories, and empirical evidence. This integrative mapping explicates the pedagogical mechanisms underlying students' engagement, analysis, interpretation, and reflection, thereby informing the development of an evidence-based instructional framework for web-based multimodal digital literature learning in elementary education.

Table 5.

Analysis of Use of Multimodal Features to Build Literary Understanding

Multimodal Feature / Task	Learning Function	Evidence from Classroom Observation	Evidence from Student Interviews	Evidence from Teacher Interviews
Audiovisual narratives (animation, audio)	Supporting narrative comprehension and plot analysis	Students followed the story flow more accurately and discussed events coherently	"The pictures and sound help me understand the story better."	"Students grasp the storyline more easily with audiovisual support."
Pause and replay functions.	Self-paced analytical processing	Students revisited key scenes to identify essential events	"I can watch important parts again."	"Replay helps students analyze details."
Guided analytical questions	Scaffolding analytical reasoning	Students structured their responses around prompts	"The questions help me think about the story."	"Guiding questions make analysis more focused."
Interactive multimodal tasks (group work)	Collaborative meaning-making	Increased peer discussion and shared interpretation	"It's easier to discuss when we see the pictures together."	"Group tasks increase participation."
Multimodal evidence prompts	Encouraging evidence-based interpretation	Students cited images and sounds to justify responses	"I can show the picture that proves my answer."	"Students now use visual evidence."
Reflective value-based tasks	Fostering moral and social reflection	Students linked story values to personal experiences	"The story teaches us to help others."	"Reflection tasks deepen ethical discussion."

Table 6.

Analysis of Integration of Quantitative and Qualitative Findings

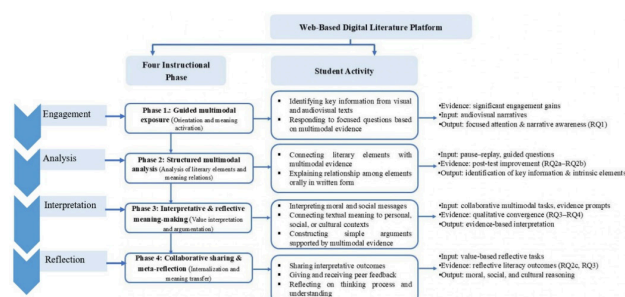
Literacy Stage	Instructional Phase	Instructional Input	Instructional Design	Cognitive & Literacy Output	Thematic Analysis	Empirical Evidence (RQ)	Pedagogical Function (Meta-Inference)
Engagement	Phase 1: Guided Multimodal Exposure	Audiovisual narratives (cerita digital multimodal)	Pertanyaan terpadu, eksplorasi visual-audio	Focused attention, narrative awareness	Meaning activation	RQ1 (significant engagement gains)	Affective activation and meaning schemata as the foundation of literacy
Analysis	Phase 2: Structured / Focused Meaning Construction	Pause-replay, guided questions	Worksheet multimodal, diskusi terstruktur	Identifikasi informasi kunci & unsur intrinsik	Analytical literacy	RQ2a–RQ2b (post-test improvement)	Multimodal evidence-based literary analysis scaffolding
Interpretation	Phase 3: Interpretative Meaning-Making	Collaborative multimodal tasks, evidence prompts	Diskusi reflektif, koneksi nilai	Interpretasi berbasis bukti multimodal	Value interpretation	RQ3–RQ4 (qualitative convergence)	Meaning construction, justification, and argumentation
Reflection	Phase 4: Collaborative Reflection / Value-Oriented Response	Value-based reflective tasks	Peer feedback, meta-reflection	Penalaran moral, sosial, dan budaya	Metacognitive internalization	RQ2c, RQ3 (reflective literacy outcomes)	Internalization of values and transfer of understanding

Based on the triangulation of quantitative results (RQ1–RQ2) and qualitative findings (RQ3–RQ4) through thematic analysis, this study formulates a web-based multimodal digital literature instructional framework operating across four progressive literacy phases: engagement, analysis, interpretation, and reflection.

These phases do not function in isolation; instead, they constitute a sequenced pedagogical mechanism that explains how learning gains are generated. The guided multimodal exposure phase activates initial meaning-making and student engagement (RQ1), which serve as prerequisites for evidence-based literary analysis in the structured analysis phase (RQ2a–RQ2b). Subsequently, the interpretative meaning-making phase enables students to collaboratively construct literary meanings and values, as indicated by the convergence of qualitative evidence (RQ3–RQ4). This process culminates in the collaborative reflection phase, where metacognitive reflection and value-based reasoning signal the internalization and transfer of meaning (RQ2c, RQ3).

Accordingly, RQ5 is addressed through meta-inference, demonstrating that effective multimodal digital literature instruction in elementary education requires a staged, evidence-informed, and reflective instructional design, rather than the mere adoption of digital technologies or texts. The conceptual framework for web-based multimodal digital literature instruction is presented in Figure 6.

Figure 6.
The conceptual framework for web-based multimodal digital literature instruction is presented



Discussion

The findings addressing RQ1 suggest that the implementation of the pedagogically designed web-based digital literature platform created learning conditions that encouraged students to become more actively involved in literacy activities. Classroom observations indicated that students demonstrated greater persistence in exploring stories, revisiting narrative segments, and participating in discussions compared to their engagement during conventional literacy instruction. This pattern suggests that literacy engagement in this study was not merely reflected in students' enjoyment of digital media but in their

increased willingness to invest attention and cognitive effort in understanding literary texts.

The findings addressing RQ1 demonstrate that the eight-week intervention using a pedagogically designed web-based digital literature platform produced a substantial and educationally meaningful improvement in students' literacy engagement. The magnitude of this effect suggests that the intervention was practically significant in its impact on student learning. The findings addressing RQ1 demonstrate that the eight-week intervention produced a substantial and educationally meaningful improvement in students' literacy engagement. This large effect size aligns with contemporary research positioning multimodal text environments as catalysts for student motivation, focused attention, and active participation, which are widely recognized as prerequisites for deeper cognitive processing. However, the present study indicates that the positive impact of multimodal environments cannot be attributed solely to technological features. Field observations revealed that students' engagement became more meaningful when multimodal resources were accompanied by guided learning activities that directed attention toward story content and interpretation. Therefore, engagement should be understood not merely as an affective outcome but as a pedagogical mechanism that enables students to access textual meaning and participate more deeply in literacy learning processes.

The triangulated findings addressing RQ2 demonstrate that students developed stronger multimodal literary literacy, particularly in identifying key information, analyzing intrinsic literary elements, and interpreting moral and social meanings embedded in literary texts. Qualitative evidence revealed that students gradually progressed from retelling story events toward providing explanations and interpretations supported by textual, visual, and auditory evidence. Such development suggests that multimodal literacy involves more than comprehension of narrative content; it requires learners to integrate multiple semiotic resources in constructing meaning.

These findings are consistent with studies showing that structured multimodal learning activities, including guided questioning, replay opportunities, and evidence-based tasks, can enhance learners' internal representations and facilitate analytical reasoning (Liang & Hwang, 2023; Shen et al., 2023). Nevertheless, the present study extends previous findings by demonstrating that such cognitive development can occur effectively in elementary education contexts when multimodal affordances are systematically integrated with instructional scaffolding. This suggests that multimodal literacy growth is not an automatic consequence of exposure to digital texts but rather the result of carefully designed pedagogical

processes that support evidence gathering, analysis, and interpretation.

The qualitative findings addressing RQ3 further illuminate the mechanisms through which literacy development occurred. Interviews with students and teachers revealed that audiovisual features facilitated access to narrative contexts and reduced barriers to understanding literary texts. This finding is particularly relevant in elementary classrooms, where students often experience difficulty visualizing narrative settings, character relationships, and plot developments from written text alone. The availability of multimodal representations appeared to provide concrete references that supported comprehension and interpretation.

However, the findings also revealed that multimodal resources alone were insufficient to promote deeper literary understanding. Observations consistently showed that students rarely moved beyond surface-level observations without teacher intervention. Through guided questioning, interpretive modeling, and collaborative discussion, teachers encouraged students to examine narrative evidence, justify interpretations, and consider alternative perspectives. This finding supports theoretical arguments that multimodal pedagogy becomes educationally meaningful only when interactions among learners, texts, and multimodal resources are mediated through purposeful instructional design (Linder & Falk-Ross, 2024). It also aligns with sociocultural perspectives that view literacy learning as a socially mediated process in which meaning is co-constructed through interaction and guided participation.

The findings addressing RQ4 provide further insight into the pedagogical functions of specific platform features and learning activities. Observational and interview data suggest that features such as pause-replay tools, guided prompts, collaborative tasks, evidence prompts, and reflective activities played distinct but interconnected roles in supporting literacy development. Replay functions enabled students to revisit important scenes and verify interpretations using visual and auditory evidence. Guided prompts helped structure students' attention toward significant narrative elements, while collaborative activities created opportunities for negotiating and refining interpretations through peer interaction.

These findings corroborate research emphasizing that effective multimodal learning is inherently interactive and mediated rather than passive or technology-driven (Liang & Hwang, 2023; Shen et al., 2023). More importantly, the present study demonstrates how specific instructional supports transform multimodal exposure into meaningful learning experiences. The findings suggest that the educational value of multimodal platforms lies not

simply in presenting information through multiple modes but in creating opportunities for learners to engage critically with evidence, justify interpretations, and reflect on meaning. This reinforces constructivist perspectives that knowledge develops through active engagement, social interaction, and reflective inquiry.

The integration of findings across RQ1–RQ4 through triangulation and thematic analysis resulted in the identification of a four-phase instructional framework consisting of Engagement, Analysis, Interpretation, and Reflection. Rather than functioning as a descriptive sequence of learning activities, this framework provides an explanatory model of the pedagogical mechanisms underlying students' literacy development. Engagement establishes the motivational and attentional foundation necessary for participation. Analysis directs learners toward the examination of multimodal evidence. Interpretation enables students to construct and justify meaning collaboratively, while Reflection supports the internalization of values and the transfer of understanding beyond immediate learning tasks.

This framework aligns with systematic reviews of multimodal pedagogy emphasizing the importance of instructional sequencing, scaffolding, and opportunities for meaning-making across modes (Linder & Falk-Ross, 2024). At the same time, the present findings contribute a more process-oriented explanation of how literacy development unfolds in elementary digital literature instruction. The framework suggests that engagement alone is insufficient to generate meaningful learning outcomes unless it is connected to analytical, interpretive, and reflective processes. Consequently, literacy development should be understood as a progressive and interconnected process rather than a collection of isolated skills.

From a theoretical perspective, this study contributes to the growing discourse on multiliteracies and multimodal pedagogy by providing empirical evidence from an elementary education context. The findings support the proposition that literacy in contemporary digital environments extends beyond conventional print-based comprehension and involves the capacity to interpret, evaluate, and construct meaning across multiple modes of communication (Linder & Falk-Ross, 2024; Shen et al., 2023). More importantly, this study advances current understanding by demonstrating that multimodal literacy development emerges through the interaction between technological affordances and pedagogically designed learning experiences. Thus, the findings challenge technology-deterministic assumptions and reinforce the view that instructional design remains central to meaningful literacy learning.

From a practical perspective, the findings offer important implications for elementary literacy

education. In many educational settings, digital technologies are often introduced with the expectation that technological innovation alone will improve learning outcomes. However, the present findings indicate that educational benefits emerge when digital resources are integrated with structured scaffolding, collaborative inquiry, evidence-based reasoning, and reflective learning activities. Therefore, educators should focus not only on adopting digital tools but also on designing pedagogical experiences that guide students toward deeper engagement and interpretation.

Although this study was conducted in an elementary school context in Bangka Belitung using locally grounded digital literary texts, the resulting instructional framework emphasizes pedagogical mechanisms rather than cultural specificity. Guided multimodal scaffolding, analytical prompting, collaborative interpretation, and reflective meaning-making represent transferable principles that may be adapted across diverse educational contexts where digital and multimodal texts are employed to support literacy learning.

Several limitations should be acknowledged. The relatively small sample size and the limited duration of the intervention restrict the extent to which findings can be generalized across broader populations and longer periods of implementation. Furthermore, challenges related to internet connectivity and device availability highlight practical constraints that may influence scalability, particularly in resource-diverse educational environments. Similar concerns have been reported in previous educational technology studies (Liang & Hwang, 2023). Future research should therefore investigate longitudinal impacts, examine implementation across varied educational settings, and explore differentiated scaffolding strategies tailored to students with diverse literacy profiles.

Overall, this study demonstrates that web-based digital literature platforms can support meaningful literacy development when embedded within coherent pedagogical structures. The findings indicate that literacy growth occurs through the interaction of multimodal resources, instructional scaffolding, collaborative meaning-making, and reflective engagement. The resulting four-phase instructional framework offers both a theoretical contribution to multimodal literacy research and a practical guide for educators seeking to design, implement, and evaluate effective digital literature instruction in elementary education.

Conclusion

This study demonstrates that a pedagogically designed web-based digital literature platform can meaningfully enhance elementary students'

engagement with literacy and multimodal literacy when technology is embedded within a structured instructional design. The explanatory sequential mixed-methods findings indicate that improvements in engagement functioned as an enabling condition for deeper analytical, interpretative, and reflective literary processing, particularly when supported by guided multimodal scaffolding, analytical prompts, and evidence-based tasks. The resulting four-phase instructional framework—Engagement, Analysis, Interpretation, and Reflection—extends existing multimodal literacy research by explicating the pedagogical mechanisms through which digital platforms support literary meaning-making, positioning the local classroom as a pedagogical laboratory for innovation rather than a contextual limitation.

Nevertheless, several limitations warrant consideration. The relatively small sample size and the eight-week duration constrain the generalizability and longitudinal interpretation of the findings. In addition, variations in device availability and connectivity highlight implementation challenges that may affect scalability across diverse educational settings. The study primarily focused on a single instructional configuration, leaving open questions about differentiated scaffolding for learners with varied literacy profiles.

Based on the findings, the following evidence-based recommendations are offered for teachers and decision-makers.

For Teachers. Teachers should integrate guided questioning and interpretive modeling to transform students' surface-level viewing into analytical reasoning. They are encouraged to utilize pause-replay features and guided prompts to support evidence-based justification and to follow the four-phase instructional sequence (Engagement, Analysis, Interpretation, Reflection) to progressively scaffold literacy development. Additional scaffolding should be provided for students with lower initial literacy levels, as these students showed the most significant gains with structured multimodal support.

For Decision-Makers. Professional development should prioritize multimodal pedagogical mediation over technical training, as teacher scaffolding was critical to successful implementation. Digital infrastructure and device availability must be improved, as connectivity and access barriers hindered equitable participation. Curriculum frameworks should explicitly incorporate multimodal literary competencies and the four-phase instructional framework. Sustained investment is needed to support multi-site implementations and assess the framework's transferability across diverse contexts.

For Future Research. Longitudinal and multi-site studies are needed to test the framework's durability and transferability across contexts and learner populations. Further research should also explore differentiated scaffolding strategies for students with varied literacy profiles and develop infrastructure-adaptive designs for resource-limited settings.

Ethics Statements:

This research has adhered to the ethical standards of this journal.

Conflict of Interest:

The author declares that there is no conflict of interest in this publication.

Informed Consent:

All participants have agreed to participate in this study, as stated in the informed consent form, with their real names removed.

Data Availability:

All the data collected from the participants' test and observation results.

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Appendix A: Pre-Post Test Instrument

A.1 Pre-Test Instrument

Instruction:

Read the text below carefully. Answer the following multiple-choice questions based on the story entitled "Putri Tanjuk Malam" (The Princess of the Evening Glow). Choose the most appropriate answer from options A, B, C, or D.

The Story of Putri Tanjuk Malam

This folktale originates from Telak Village, on the northern coast of Bangka Island. The story is not merely about a girl's beauty but also about honesty, tradition, and the consequences of poor choices. Through dialogue and narration, this story is revived as an oral literary heritage rich in local wisdom.

In ancient times, in an old settlement called Telak Village, located on the northern coast of Bangka Island, lived a peaceful and modest Malay community. They subsisted on farming and gardening, inheriting values of tradition, togetherness, and politeness that formed the breath of their daily lives. The village stood between expanses of pepper gardens and dense surrounding forests, holding many stories and ancestral beliefs.

In Telak Village, there lived a farming couple known for their kindness and respected by the community. They had a daughter of extraordinary beauty. Her beauty was not ordinary—it was said that when night fell, her face emitted a soft glow like moonlight. Because of this unique quality, the villagers called her "Putri Tanjuk Malam" (Princess of the Evening Glow).

"My daughter, you grow more radiant each night. What makes your face shine like the full moon?"

"Mother, perhaps it is only the lamp light... or perhaps it is because of your love and Father's love for me."

"There is no one in this village who does not know you. Even word of you has reached across the sea."

The nickname "Putri Tanjuk Malam" became legendary, spreading beyond Bangka Island. Days passed peacefully in Telak Village until one day, a wealthy merchant from across the sea arrived. Some said he came from Palembang, but most believed he came from Lingga Island, a territory of the Riau-Lingga Sultanate not far from Bangka. The merchant was known to be honorable, well-spoken, and possessed vast wealth.

His purpose for coming to Telak Village remained a question. Some said he came to trade, but many

believed he came specifically to propose to Putri Tanjuk Malam, for news of her beauty had reached the ears of the nobles in Lingga.

Upon arriving in Telak Village, the merchant met the princess's parents and stated his intention to marry the girl and take her to live on Lingga Island. However, the proposal was not welcomed with joy. The parents, though respectful of guests and maintaining Malay courtesy, politely declined. They did not want their only daughter to leave her homeland, especially for a distant and unfamiliar place.

"Sir, allow me to propose to your daughter, whose beauty has spread even to the palace. I promise to make her a queen in my land."

"Honorable Merchant, we are honored to receive a guest as noble as you. However... our daughter does not wish to be far from her ancestral land."

The princess peeked from behind the door, weeping softly.

"Mother... I do not want to leave. But I am afraid that refusing will hurt him."

"Be calm, my child. We will find a way that does not disgrace our customs and dignity."

Putri Tanjuk Malam shared the same sentiment. She was unwilling to leave her parents. However, bound by tradition and politeness, they did not want to refuse directly. So they devised a plan—a fake death drama to cancel the proposal without wounding anyone's pride.

When the merchant returned to Lingga to prepare for the wedding, the princess's family began digging a fake grave beside their house. Their plan was to bury the princess alive temporarily with the help of a bamboo tube as an air passage. They hoped that when the merchant returned and saw the princess's grave, he would believe the girl had died and abandon his intention.

Several days later, the merchant returned to Telak Village. He came with a large entourage, bringing various gifts, including bars of pure gold intended as a dowry. But what he found was not a wedding celebration but an atmosphere of mourning. The princess's parents wept and informed him that their daughter had died suddenly.

The merchant was stunned. He rushed to the princess's grave not far from the house. There, with a broken heart, he knelt and spoke softly,

"Alas, my beloved... you have departed."

As the word “departed” was spoken, lightning struck across the previously clear sky. Nature seemed to convey a message beyond human understanding. Inside the narrow hole where the princess hid, the air suddenly became heavy. Putri Tanjuk Malam struggled to breathe, and without anyone knowing, she breathed her last breath.

Unaware of what had happened beneath the earth, the merchant then placed the gold bars he had brought as a tombstone on the princess's grave. With a shattered heart, he left Telak Village, carrying an incurable wound.

Sometime later, the princess's parents, relieved that their plan had succeeded, intended to dig up the fake grave. However, how shocked they were to find the princess's body blue and stiff. The girl they loved had truly died. Weeping and sorrow broke out, accompanying deep regret for having toyed with fate.

They reburied her properly. Since then, it is said that on moonlit nights, the princess's grave emits a soft glow from beneath the earth—the light of her eternal beauty, a sign of regret, and a blessing that never fades.

The grave later became known to the community as the Keramat (Sacred Site) of Putri Tanjuk Malam, believed to be a sacred and mysterious place. Its location is now hidden deep in the forest of Telak Village, and only a few elders have ever known its whereabouts—one of them an old man who saw it as a child, but who no longer knows its exact location as the forest has changed.

Questions:

Choose the most appropriate answer from options A, B, C, or D.

1. What was the main purpose of the merchant's arrival in Telak Village?

- a. To open a new trading business
- b. To invite the villagers to sail to Lingga Island
- c. To propose to Putri Tanjuk Malam for marriage
- d. To offer modern agricultural assistance

2. What caused the death of Putri Tanjuk Malam?

- a. She was poisoned by her parents
- b. She died of profound grief
- c. She actually died from oxygen deprivation in the fake grave
- d. She was killed by the angry merchant

3. What is the main theme of the story “Putri Tanjuk Malam”?

- a. Rejection of arranged marriage by noble families
- b. The conflict between tradition and personal desire leading to regret
- c. True love fought for until the end of life
- d. Competition between villagers and foreign nobles

4. Which sequence of events is correct in the story?

- a. Proposal – Rejection – Princess dies – Merchant returns home
- b. Princess dies – Merchant arrives – Proposal rejected – Plan is made
- c. Princess is known for beauty – Proposal – Fake grave plan – Princess truly dies
- d. Merchant marries Princess – Princess dies – Parents regret

5. What is the main setting of the story?

- a. The palace of the Riau-Lingga Sultanate
- b. Telak Village on the northern coast of Bangka Island
- c. Lingga Island and its surrounding seas
- d. A noble's house in Palembang

6. Who is the main character in the story?

- a. The princess's parents
- b. The merchant from Lingga Island
- c. Putri Tanjuk Malam
- d. The old tomb keeper

7. What is the main message that can be taken from the story?

- a. Beauty can bring disaster
- b. A small lie can save one's honor
- c. No one can oppose God's will
- d. Leaving one's hometown is wrong

8. What moral value can be learned from the story?

- a. A polite refusal always brings good results
- b. Honesty and courage in facing reality are better than lies
- c. Following parents' wishes is an absolute obligation
- d. Rejecting someone's proposal will bring a curse

9. What life value is reflected in the story?

- a. Parents must fulfill all their children's desires for their happiness
- b. Honesty and courage in making decisions are better than deceiving to maintain tradition
- c. The princess should have accepted the proposal from the nobleman
- d. Living in a village is better than moving to another land

10. What is the most appropriate conclusion from the story?

- a. Proposals from nobles must always be accepted for the sake of honor
- b. Well-prepared plans will always succeed
- c. Humans cannot control fate, and lies can bring disaster
- d. It is better to leave one's homeland for personal happiness

A.2 Post-Test Instrument

Instruction:

Watch the animated video version of the story "Putri Tanjuk Malam" available at the link below. Then answer the following multiple-choice questions based on the video. Choose the most appropriate answer from options A, B, C, or D.

Video Link:

https://drive.google.com/file/d/1Dm93jlmYADMfetuOO6t53kjc_r_sNI7n9/view?usp=drive_link

Questions:

1. What was the main purpose of the merchant's arrival in Telak Village?

- a. To open a new trading business
- b. To invite the villagers to sail to Lingga Island
- c. To propose to Putri Tanjuk Malam for marriage
- d. To offer modern agricultural assistance

2. What caused the death of Putri Tanjuk Malam?

- a. She was poisoned by her parents
- b. She died of profound grief
- c. She actually died from oxygen deprivation in the fake grave
- d. She was killed by the angry merchant

3. What is the main theme of the story "Putri Tanjuk Malam"?

- a. Rejection of arranged marriage by noble families
- b. The conflict between tradition and personal desire leading to regret
- c. True love fought for until the end of life
- d. Competition between villagers and foreign nobles

4. Which sequence of events is correct in the story?

- a. Proposal – Rejection – Princess dies – Merchant returns home
- b. Princess dies – Merchant arrives – Proposal rejected – Plan is made
- c. Princess is known for beauty – Proposal – Fake grave plan – Princess truly dies
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