

The Effect of Story Mapping On Reading Comprehension of Eleventh-Grade Students

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Abstract.

Reading comprehension remains a persistent challenge in English as a Foreign Language (EFL) instruction, particularly when secondary learners engage with complex expository genres such as analytical and hortatory exposition. Although story mapping strategies have been extensively validated within narrative reading context, their pedagogical efficacy in structuring expository text comprehension remains underexplored. This pre-experimental study investigated the effect of the Story Mapping strategy on the reading comprehension achievement of eleventh-grade EFL students at MAN 1 Pekanbaru, Indonesia. Utilizing a one-group pretest-posttest design, thirty-two students selected via cluster random sampling participated in a four-session instructional intervention integrating graphic-based story mapping techniques. Data were collected using a validated 32-item multiple-choice test evaluating five comprehension dimensions: main idea identification, detailed information extraction, reference recognition, inferential reasoning, and vocabulary in context. Non-parametric analysis using the Wilcoxon Signed-Rank Test revealed a statistically significant improvement in reading performance from pre-test ($M = 31.15$, $SD = 6.42$) to post-test ($M = 54.59$, $SD = 12.18$), with $Z = -4.791$ and $p < .001$. Normalized Gain analysis ($N\text{-Gain} = 0.33$) demonstrated moderate pedagogical effectiveness. These findings confirm that adapting story mapping as a structural visual organizer significantly facilitates schema activation and text-base mental model construction in expository reading.

Keywords: Analytical exposition, EFL reading comprehension, graphic organizers, hortatory exposition and story mapping strategy.

I. INTRODUCTION

Reading comprehension is a fundamental pillar of language acquisition and academic success in English as a Foreign Language (EFL) educational frameworks. In higher-level secondary education, reading is no longer merely a mechanical decoding process; rather, it demands active cognitive processing, critical reasoning, and the construction of coherent mental representations from complex textual structures. According to interactive literacy models, effective comprehension requires readers to integrate bottom-up linguistic decoding—such as lexical recognition and syntactic parsing—with top-down cognitive strategies, including schema activation, background knowledge integration, and macrostructural inference generation. According to the Interactive Model of Teaching Reading Comprehension developed by Hamra and Syatriana (2010), effective comprehension requires readers to integrate bottom-up linguistic decoding with top-down cognitive strategies, including schema activation and background knowledge integration. However, for many EFL learners in non-English speaking environments like Indonesia, reaching advanced reading proficiency presents substantial pedagogical hurdles.

Preliminary observations and unstructured diagnostic interviews with English teachers at MAN 1 Pekanbaru revealed persistent systemic challenges in students' reading performance, particularly when interacting with non-narrative texts. Indonesian high school students frequently struggle with expository prose. The primary instructional difficulties identified include:

- Limited academic vocabulary, which hinders precise contextual translation and synonym/antonym recognition.
- Low intrinsic motivation and anxiety when confronted with dense, argument-heavy reading passages.
- Ineffective deployment of metacognitive reading strategies, such as skimming for main ideas, scanning for key details, and drawing logical inferences.

These affective and cognitive impediments frequently result in low self-esteem and unsatisfactory academic achievement, as students remain passive readers unable to express critical thoughts or evaluate authorial viewpoints.

In the Indonesian Senior High School (Kurikulum Merdeka / K-13) English curriculum, eleventh-

grade students are required to master argumentative and persuasive text genres, specifically Analytical Exposition and Hortatory Exposition. Analytical exposition aims to convince the reader that an issue or phenomenon is noteworthy by presenting logical arguments, whereas hortatory exposition seeks to persuade the audience to adopt a specific course of action or refrain from a particular behavior through explicit recommendations. Both genres feature dense logical structures, specialized transitional markers, complex passive structures, and modal auxiliaries. Without structural scaffolding, EFL students often view these texts as disjointed collections of facts rather than unified argumentative frameworks.

To address these cognitive barriers, visual scaffolding strategies—specifically graphic organizers—have gained substantial attention in educational research. Among these, the Story Mapping strategy has emerged as a powerful pedagogical tool. Originally derived from story grammar theory, story mapping provides a visual schema that outlines the structural elements of a text, illustrating how various components interact to form a cohesive narrative or argument. Prior research has widely substantiated the effectiveness of story mapping in improving narrative text comprehension, narrative recall, and student engagement across diverse educational settings. By converting abstract text structures into concrete visual representations, story maps help lower cognitive load, enhance working memory efficiency, and promote active schema construction.

Despite the extensive literature supporting story mapping in narrative contexts, a critical research gap remains in EFL reading pedagogy. Most empirical investigations on story mapping have focused almost exclusively on narrative texts, creative writing, or young primary learners. Few empirical studies have systematically examined whether story mapping—traditionally a narrative tool—can be adapted as a graphic scaffolding mechanism to enhance high school students' comprehension of expository and argumentative genres, such as analytical and hortatory exposition. Argumentative texts possess fundamentally different macrostructures (thesis, supporting arguments, reiteration/recommendation) compared to narrative texts (orientation, complication, resolution). Therefore, empirical inquiry is needed to evaluate whether adapting story mapping to expository text structures yields significant measurable gains in reading comprehension achievement among secondary EFL learners.

To fill this empirical gap, this study investigated the effect of implementing the Story Mapping strategy on the reading comprehension achievement of eleventh-grade students at MAN 1 Pekanbaru when engaging with analytical and hortatory exposition texts. Specifically, this study addressed the following research questions:

1. How effective is the implementation of the Story Mapping strategy in improving students' reading comprehension achievement in analytical and hortatory exposition texts?
2. Is there a statistically significant difference in students' reading comprehension achievement scores before and after the implementation of the Story Mapping strategy?

II. METHODS

Research Design

This study adopted a quantitative approach using a pre-experimental design, specifically the one-group pretest-posttest design. This design was selected due to administrative constraints in school class assignments that precluded full random assignment or the establishment of a parallel control group without disrupting ongoing institutional schedules. The structural model of the research design is represented as follows: O1 X O2, where O1 represents the baseline reading comprehension pre-test administered before the intervention, X represents the experimental treatment consisting of four instructional sessions utilizing the adapted Story Mapping strategy, and O2 represents the post-test administered immediately after completion of treatment.

Participants and Sampling

The target population comprised all eleventh-grade students at MAN 1 Pekanbaru during the 2025/2026 academic year, totaling 364 students distributed across 12 intact classes (XI.1 to XI.12). To select a representative sample while maintaining natural classroom settings, a cluster random sampling technique was employed. Using a randomized wheel selection procedure, Class XI.9 UNGGUL FKE 2 was selected as

the sample group. The sample consisted of $N = 32$ students (12 male, 20 female) with an age range of 16 to 17 years. All participants shared similar socio-cultural backgrounds and had completed identical foundational English coursework mandated by the national curriculum prior to the study.

Research Instruments

Data were collected using a standardized Reading Comprehension Achievement Test developed by the researcher based on the national senior high school English curriculum specifications. The instrument comprised 32 multiple-choice questions with five response options (A, B, C, D, E). Parallel forms were constructed for the pre-test and post-test to minimize testing threats, utilizing identical construct blueprints but distinct reading texts of equivalent Lexile readability levels.

The reading texts covered topics within analytical exposition (e.g., "5 Drinks to Help You Lose Weight", "Faster Planes and Cheaper Flights", "Boarding School Education", "Women Need Higher Education") and hortatory exposition (e.g., "Tattooing", "Tourism Benefit on Local People", "A Needle or Reuse Needles", "Should Americans be Forced to Use Public Transportation?"). The test blueprint targeted core reading comprehension components outlined in Table 1.

Table 1. Test Blueprint and Item Distribution

No	Comprehension Skill / Target Sub-construct	Item Distribution
1	Identifying Main Idea	4, 9, 17, 25
2	Locating Detailed Information (5W1H)	1, 10, 20, 26
3	Identifying Pronominal References	5, 11, 19, 27
4	Making Logical Inferences	3, 13, 23, 28
5	Understanding Vocabulary in Context	6, 14, 21, 29
6	Recognizing Social Function / Purpose	8, 12, 18, 30
7	Analyzing Generic Structure (Thesis/Args)	2, 16, 22, 31
8	Analyzing Generic Structure (Reiter/Recom)	7, 15, 24, 32

Prior to data collection, the instrument underwent two rounds of field try-outs ($N = 32$ non-sample peer group) to establish construct validity and empirical reliability. Item validity was evaluated using Pearson Product-Moment correlation in SPSS version 27. Items exhibiting $r_{\text{count}} > r_{\text{table}}$ (0.381, $df = 30$, $\alpha = .05$) were declared valid. Initial analysis identified 29 valid items and 3 invalid items (items 11, 13, and 18). Following item revision and a second try-out, all 32 items met validity criteria. Test reliability was established using the Guttman Split-Half Coefficient. The resulting reliability coefficient was $r = .942$ ($r > 0.381$), confirming high internal consistency and measurement stability.

Data Collection Procedure

The research intervention was conducted over four weeks, comprising three distinct operational phases:

- **Phase 1: Diagnostic Baseline:** Administration of 32-item Reading Comprehension Pre-Test (O1).
- **Phase 2: Pedagogical Intervention (4 Treatment Sessions):** Teacher modeling of story mapping on transparency/board; guided practice (guided identification of thesis/arguments); independent & collaborative graphic map completion; text reconstruction & analytical feedback sessions.
- **Phase 3: Post-Intervention Evaluation:** Administration of 32-item Reading Comprehension Post-Test (O2).

The instructional procedures adapted Idol's (1987) scaffolding model to expository reading structures. During treatment sessions, students were taught to map expository text elements into structured visual diagrams:

- **Central Node:** Main Title and Author's Thesis Statement.
- **Secondary Nodes:** Core Supporting Arguments and Empirical Evidence.
- **Tertiary / Closing Nodes:** Reiteration (for Analytical Exposition) or Explicit Recommendations (for

Hortatory Exposition).

Data Analysis

Quantitative data were processed using IBM SPSS Statistics version 27. Descriptive statistics (means, standard deviations, minimum/maximum scores, frequency distributions) were computed for both pre-test and post-test scores. To determine the appropriate statistical testing strategy, dataset normality was assessed using the Shapiro-Wilk Test. Because the distribution violated normality assumptions ($p < .05$), the non-parametric Wilcoxon Signed-Rank Test was conducted to evaluate significant mean differences between pre-test and post-test performance.

To quantify the magnitude of learning gain and pedagogical effectiveness, the normalized gain score (N-Gain) was computed using Hake's formula: $\text{Normalized Gain (g)} = (\text{Posttest Score} - \text{Pretest Score}) / (\text{Maximum Score} - \text{Pretest Score})$. The calculated N-Gain score was categorized using Sugiyono (2015) criteria: High ($g > 0.70$), Moderate ($0.30 \leq g \leq 0.70$), and Low ($g < 0.30$).

III. RESULT AND DISCUSSION

Pre-Test Baseline Achievement

The pre-test measured participants' baseline reading comprehension proficiency prior to the story mapping intervention. Out of a maximum possible score of 100, the baseline mean score was $M = 31.15$ ($SD = 6.42$), with scores ranging from a minimum of 21.80 to a maximum of 46.80.

Table 2. Descriptive Statistics of Pre-Test and Post-Test Scores (N = 32)

Metric	Pre-Test Score	Post-Test Score
Total Sum	996.80	1746.80
Mean	31.15	54.59
Standard Deviation	6.42	12.18
Minimum Score	21.80	34.30
Maximum Score	46.80	84.30

The frequency distribution of pre-test scores revealed widespread difficulties in comprehending expository texts. Over 71.8% of students scored in the lowest performance categories.

Table 3. Frequency Distribution of Pre-Test Reading Comprehension Scores

Score Interval	Category / Predicate	Frequency (f)	Percentage (%)
21-25	Very Poor / Very Low	11	34.38%
26-30	Poor / Low	5	15.63%
31-35	Fair / Moderate	7	21.88%
36-40	Good / High	5	15.63%
41-45	Very Good / High	3	9.38%
46-50	Excellent / Very High	1	3.13%

As illustrated in Table 3, 34.38% ($n = 11$) of students performed at the "Very Poor" level, and 15.63% ($n = 5$) scored in the "Poor" range. Only a small fraction of participants achieved scores above 40 (12.51% combined). These baseline data indicate that students had difficulty extracting main ideas, identifying logical argument structures, and drawing implicit inferences from analytical and hortatory exposition texts prior to instruction.

Post-Test Achievement

Following the four-session story mapping intervention, participants took an equivalent post-test.

Descriptive analysis revealed an overall mean score increase to $M = 54.59$ ($SD = 12.18$), representing a 23.44-point gain over the pre-test mean. Post-test scores ranged from a minimum of 34.30 to a maximum of 84.30.

Table 4. Frequency Distribution of Post-Test Reading Comprehension Scores

Score Interval	Category / Predicate	Frequency (f)	Percentage (%)
34-42	Very Poor / Very Low	5	15.63%
43-51	Poor / Low	10	31.25%
52-60	Fair / Moderate	8	25.00%
61-69	Good / High	5	15.63%
70-78	Very Good / High	1	3.13%
79-87	Excellent / Very High	3	9.38%

As detailed in Table 4, post-test score distributions shifted visibly toward higher proficiency tiers. Students in the "Very Poor" category decreased from 34.38% to 15.63%. Furthermore, 28.14% ($n = 9$) of participants reached the upper performance bands (61 to 87), with 3 students (9.38%) achieving scores in the "Excellent" category (79-87).

Normality Testing and Hypothesis Testing

To select the appropriate statistical test for hypothesis evaluation, normality testing was performed using SPSS version 27.

Table 5. Tests of Normality for Pre-Test and Post-Test Scores

Test Variable	Shapiro-Wilk Statistic	Degrees of Freedom (df)	Sig.
Pre-Test	.913	32	.013
Post-Test	.930	32	.040

The Shapiro-Wilk test yielded significance values of $p = .013$ for the pre-test and $p = .040$ for the post-test. Because both values were below the standard significance threshold ($\alpha = .05$), the assumption of normality was rejected. Consequently, the non-parametric Wilcoxon Signed-Rank Test was conducted to determine whether the intervention produced a statistically significant difference in paired reading performance.

Table 6. Wilcoxon Signed-Rank Test Results

Test Statistic Metric	Post-Test - Pre-Test Comparison
Z-Statistic	-4.791
Asymptotic Significance (2-tailed, p)	.000

Note: Based on negative ranks (all 32 participants showed positive gains).

The Wilcoxon Signed-Rank Test yielded $Z = -4.791$ with an asymptotic two-tailed significance value of $p < .001$. Because the obtained p-value was below the significance level of .05, the null hypothesis (H_0) was rejected, providing statistical support for the alternative hypothesis (H_a). This result indicates a statistically significant difference in students' reading comprehension performance before and after the Story Mapping intervention.

Effectiveness Analysis (N-Gain)

To measure the overall pedagogical effectiveness of the intervention, the Normalized Gain (N-Gain) was computed for all 32 participants.

Table 7. N-Gain Descriptive Analysis

Metric	Value
Mean N-Gain Score	0.3327
Mean N-Gain Percentage	33.27%
Minimum N-Gain	0.00
Maximum N-Gain	0.79
Standard Deviation	0.200
Effectiveness Category	Moderate ($0.30 \leq g \leq 0.70$)

The analysis yielded a mean N-Gain score of 0.3327 (33.27%). According to Sugiyono (2015) classification criteria, an N-Gain value within $0.30 \leq g \leq 0.70$ falls into the Moderate Effectiveness category. This finding indicates that the Story Mapping strategy was effective in facilitating measurable learning improvements in senior high school EFL expository reading comprehension.

The empirical findings of this research demonstrate that the Story Mapping strategy significantly improved students' reading comprehension achievement in analytical and hortatory exposition texts. The observed mean score increase from 31.15 to 54.59, supported by the statistically significant Wilcoxon test result ($Z = -4.791, p < .001$), confirms that graphic scaffolding interventions can effectively enhance EFL reading performance. Furthermore, the N-Gain index of 0.33 places this pedagogical strategy within the moderate effectiveness range, supporting its practical application in secondary language classrooms.

These findings align with and extend existing theoretical frameworks regarding reading comprehension as an interactive cognitive process. According to schema theory and cognitive load principles, reading comprehension requires readers to build a mental representation (a situation model) of text content. Expository genres present specific cognitive challenges for EFL learners because they lack the sequential narrative timelines that typically aid recall. By utilizing story mapping as a structural graphic organizer, students were able to visually decompose complex argumentative passages into functional units: isolating the thesis statement, grouping primary and secondary supporting arguments, and linking logical conclusions or recommendations.

This visual transformation reduces working memory strain, allowing learners to allocate greater cognitive resources toward higher-order skills, such as inferential reasoning and vocabulary analysis. As Antonacci and O'Callaghan (2012) noted, visual graphic representations help readers store, organize, and retrieve abstract textual elements.

The empirical gains observed in this study corroborate several recent findings in EFL literacy research. "While traditional applications of story mapping have focused primarily on narrative genres—such as studies by Anggraeny et al. (2015) and Selviana (2014)—this investigation demonstrates that graphic mapping strategies can be successfully adapted to non-narrative expository prose."

Furthermore, recent empirical research underscores the role of structural scaffolding in improving reading outcomes across diverse instructional contexts:

- Baltazar and Ong (2025) demonstrated that integrating story mapping with visualization strategies significantly enhanced reading recall and structural analysis among high school learners. Their work supports our finding that visual schema building aids text comprehension.
- Caponayan et al. (2024) emphasized that graphic organizers act as essential cognitive bridges, enabling EFL students to identify macro-structural arguments in non-narrative reading tasks.
- Francisco (2024) highlighted that scaffolded reading experiences combining visual and textual prompts effectively support low-performing readers by reducing anxiety and guiding text processing.
- Navarro et al. (2023) confirmed that structured visual strategies enhance decoding accuracy and reading comprehension in crowded classroom environments.
- Syahada (2023) observed that explicit instructional modeling using visual organizers led to

improvements in both reading comprehension and analytical writing fluency among Indonesian secondary learners.

- Chikamadu et al. (2022) validated the cross-cultural efficacy of graphic scaffolding, reporting gains in student engagement, vocabulary retention, and critical reading performance.
- Lee et al. (2022) noted that systematic visual organizers assist language learners in recognizing discourse markers and logical relationships within persuasive texts.
- Ligudon and Ildefonso (2022) reported that structured pre-reading, during-reading, and post-reading graphic strategies effectively mitigate vocabulary deficits and improve reading retention.
- Lopez and Mendoza (2021) demonstrated that strategic graphic mapping interventions produced strong post-test reading gains compared to traditional lecture-based instruction.
- Kim (2026) emphasized through the Interactive Dynamic Literacy Model that shared structural awareness between reading and writing processes reinforces overall linguistic comprehension.

From a practical perspective, adapting story maps for expository reading addresses several common classroom challenges. EFL students often read expository texts passively, struggling to distinguish main claims from supporting details. The story mapping framework requires active interaction with the text. During the intervention sessions, students worked collaboratively and individually to complete visual maps, requiring them to identify key argument structures explicitly. This active involvement likely contributed to the gains observed across comprehension sub-skills, particularly main idea identification, detailed information extraction, and structural analysis.

However, several limitations should be considered when interpreting these findings. First, the study employed a pre-experimental one-group pretest-posttest design without a parallel control group, which limits the ability to isolate the treatment effect from external variables fully. Second, the sample size was restricted to 32 students from a single educational institution, suggesting caution when generalizing findings to broader populations. Third, while the four-session intervention yielded measurable improvements, the overall post-test mean ($M = 54.59$) indicates that many students continue to face reading challenges, highlighting the need for longer-term, sustained pedagogical interventions.

IV. CONCLUSION

This study investigated the effectiveness of the Story Mapping strategy in improving the reading comprehension achievement of eleventh-grade EFL students at MAN 1 Pekanbaru when engaging with analytical and hortatory exposition texts. The empirical findings lead to the following key conclusions:

1. The implementation of the Story Mapping strategy produced a statistically significant improvement in students' expository reading comprehension achievement ($Z = -4.791$, $p < .001$).
2. The average reading comprehension score increased substantially from a baseline pre-test mean of 31.15 to a post-test mean of 54.59.
3. The calculated N-Gain score of 0.33 establishes that the story mapping strategy offers moderate pedagogical effectiveness as a structural visual organizer in EFL reading instruction.

results confirm that adapting graphic mapping strategies to expository genres helps secondary EFL students visually organize text structures, activate appropriate background schemas, and extract core arguments more effectively.

Recommendations:

1. **For English Teachers:** Language educators should consider incorporating graphic organizers and adapted story mapping frameworks into secondary EFL reading instruction. Rather than relying solely on traditional comprehension questions, teachers can use visual mapping to help students analyze complex genres, such as analytical exposition, hortatory exposition, and news items.
2. **For Students:** EFL learners are encouraged to adopt visual graphic strategies as self-regulated reading tools. Creating visual outlines during reading can help students process complex academic texts, organize key details, and improve vocabulary retention.
3. **For Future Researchers:** Future studies should address the limitations of this work by employing true experimental or quasi-experimental designs with larger sample sizes and dedicated control groups.

Research could also examine the long-term retention effects of story mapping or explore the integration of digital interactive graphic organizers in blended learning environments.

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