

MINDOMO-ASSISTED MIND MAPPING AS A PREWRITING SCAFFOLD FOR EFL DESCRIPTIVE WRITING: A ONE-GROUP PRETEST-POSTTEST STUDY

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ABSTRAK

Planning ideas before drafting is a persistent challenge for learners who write in English as a foreign language. This quantitative pre-experimental study examined changes in descriptive writing performance after Grade XI students at SMAN 3 Teupah Selatan used Mindomo-assisted mind mapping as a prewriting scaffold. Nineteen students from class XI-1 were selected purposively from a population of 140 students. Using a one-group pretest-posttest design, students completed an initial descriptive paragraph, participated in four instructional sessions on constructing and using digital mind maps, and completed a posttest. The writing tasks were assessed in terms of content, organization, vocabulary, grammar, and mechanics. The available summary data showed that the mean score increased from 46.44 to 77.72, a difference of 31.28 points. The reported mean normalized gain was 57.06%, with individual values ranging from 26.67% to 76.79%. These descriptive results indicate substantial within-group improvement and suggest that digital mind mapping can help learners generate details, visualize relationships among ideas, and use a plan while drafting. The findings do not establish a causal effect, however, because the study had no comparison group, involved a small purposive sample, and did not provide student-level paired scores for an appropriate inferential reanalysis. Further controlled research should examine whether the observed improvement is attributable to Mindomo-assisted planning rather than repeated practice or teacher support.

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INTRODUCTION

Writing in a foreign language requires learners to coordinate idea generation, organization, lexical selection, grammatical encoding, and mechanical accuracy. These demands are especially pronounced when learners have limited linguistic resources and must simultaneously decide what to say and how to express it. Process-oriented and self-regulated writing instruction addresses this complexity by making planning, drafting,

monitoring, revising, and feedback explicit rather than treating a completed text as the only instructional outcome (Teng & Zhang, 2020; Guo et al., 2021). Planning should nevertheless be operationalized carefully because its effects differ across planning modes and writing outcomes (Abdi Tabari, 2021; Johnson & Abdi Tabari, 2023).

Descriptive writing requires writers to identify a subject and develop a coherent impression through selected details. At paragraph level, quality depends on the relevance and development of content, the logical relationship among ideas, appropriate vocabulary, accurate sentence construction, and control of spelling and punctuation. Recent research on EFL descriptive and narrative writing likewise treats organization, development, sentence structure, word choice, grammar, and mechanics as distinguishable but interrelated dimensions of performance (Pourdana & Asghari, 2021).

Preliminary observation in Grade XI at SMAN 3 Teupah Selatan indicated that students frequently struggled to begin a descriptive paragraph, expand a topic into supporting details, and select sufficiently precise vocabulary. Weak grammatical control further complicated the conversion of ideas into sentences. These difficulties suggested that students needed structured support before drafting, when decisions about content and organization could be separated temporarily from sentence-level editing.

Research on collaborative prewriting further shows that planning is not only an individual cognitive activity. Small-group talk can help EFL learners generate content, language, and organizational options before individual drafting (Li et al., 2020). Its benefits, however, depend on how participation is structured: one study found an advantage for unstructured collaborative prewriting (Beiki et al., 2020), whereas other studies reported improvements from structured student talk and student-led discussion, particularly in content, organization, and vocabulary (Li & Zhang, 2021; Heidari Darani et al., 2023). These findings support explicit scaffolding while cautioning against assuming that a single prewriting format will benefit every class in the same way.

Mind mapping is a visual prewriting strategy in which a central topic is connected to branches representing categories, key words, examples, or supporting details. The map externalizes relationships that may otherwise remain implicit and gives learners a visible plan to consult while drafting. In EFL contexts, computerized mind mapping has been associated particularly with gains in content and organization and with positive learner experiences during prewriting (Sebit & Yildiz, 2020). Research involving descriptive writing also indicates that mind maps can help learners visualize ideas and approach the writing process more strategically (Tarin & Yawiloeng, 2022).

Digital mapping extends this scaffold by allowing branches to be moved, expanded, color-coded, and revised without redrawing the entire plan. Mobile mind-mapping interventions have supported ESL and EFL writing by combining brainstorming with portable access and repeated revision (Abd Karim et al., 2021), while mind mapping has also supported extended writing assignments in distance-learning contexts (Pribadi & Susilana, 2021). Online mapping has also been integrated with collaborative writing to support the development of argument structure and shared decision-making (Wu & Miller, 2021). More recent comparative evidence suggests that both manual and electronic maps can support writing, while electronic mapping may offer additional flexibility during the recursive writing process (Al-Inbari et al., 2023). In higher education, video-based mind maps have also functioned as shared resources for collaborative meaning-making (Beal & Hontvedt, 2023), while AI-enhanced collaborative digital mapping has been associated with creative-thinking gains in an inclusive educational context (Fang et al., 2024).

Mindomo provides a suitable environment for this form of planning because students can create a central topic, add hierarchical branches, insert visual cues, and revise the map on a smartphone or computer. For descriptive writing, branches can represent appearance, personality, location, function, or other topic-specific categories. The application does not replace language instruction: learners still require modeling, vocabulary support, feedback, and opportunities to transform key words into coherent sentences. Evidence that mind mapping can strengthen vocabulary learning and motivation further supports integrating the map with explicit language work rather than using it as an isolated graphic activity (Feng et al., 2023).

Recent studies continue to identify mind mapping as a useful scaffold for school-age writers. Scaffolded mapping has been linked to improvements in lexical complexity, grammatical complexity, accuracy, and fluency among middle-school EFL learners (Fu & Relyea, 2024), while research published online in February 2025 found benefits of mind maps as a prewriting activity for descriptive-narrative creative writing in a technology-enhanced setting (Mustika et al., 2025). Nevertheless, evidence about digital mind mapping should not be generalized automatically to a specific application, genre, or learner group.

The present study therefore examined Mindomo-assisted mind mapping in descriptive writing instruction at an Indonesian senior high school. It asked: To what extent did the descriptive writing scores of the participating Grade XI students change after four sessions of Mindomo-assisted prewriting? The study focuses on within-group change and treats causal interpretation cautiously because no comparison class was included.

METHOD

Research Design

The study employed a quantitative pre-experimental one-group pretest-posttest design. The sequence was O1-X-O2, where O1 represented the pretest, X the four-session Mindomo-assisted mind-mapping instruction, and O2 the posttest. This design permits a description of change in the selected class but cannot rule out alternative explanations such as repeated testing, maturation, concurrent instruction, or familiarity with the writing task.

Setting and Participants

The population comprised 140 students at SMAN 3 Teupah Selatan during the 2023/2024 academic year. Class XI-1 was selected purposively, with the source record identifying variation in students' backgrounds and writing ability as the selection rationale. The final sample consisted of all 19 students in the class. The instructional condition was Mindomo-assisted mind mapping, and the outcome was performance on a descriptive paragraph writing task.

Writing Task and Assessment

Students completed pretest and posttest tasks that required a descriptive paragraph about a person. Both performances were evaluated using the same five components: content, organization, vocabulary, grammar, and mechanics. These dimensions capture both global features of the message and local features of language control. The available research record did not specify component weights, score bands, the number of raters, or inter-rater reliability; these omissions limit the reproducibility and precision of the measurement.

Table 1. Components Used to Assess Descriptive Writing

Component	Assessment focus
Content	Relevance and development of descriptive details
Organization	Logical arrangement and coherence of ideas
Vocabulary	Range and appropriateness of word choice
Grammar	Accuracy of sentence structures
Mechanics	Capitalization, punctuation, and spelling

Instructional Procedure

1. Students completed a pretest to establish their initial descriptive writing performance.
2. The researcher introduced the structure and purpose of mind maps and demonstrated the Mindomo interface.

3. Across four instructional sessions, students identified a central topic, generated and categorized descriptive details on branches, reviewed their maps, and transformed the plans into paragraphs.
4. Students completed a posttest after the four opportunities to practice the mapping-to-drafting sequence.

Instruction used picture prompts and descriptive topics to support idea generation. Teacher guidance emphasized whether each branch contributed relevant information, whether categories were logically related to the central topic, and whether the resulting paragraph reflected the map. Students were able to add, move, or revise branches before drafting, making planning visible and revisable.

Data Analysis

Pretest and posttest scores were summarized using the number of students, means, mean difference, and normalized gain (N-gain). Because the same students completed both tests, the observations were paired. The source output included a Mann-Whitney U test, which assumes independent groups and was therefore not used as evidence of statistical significance in this revised report. Student-level paired scores were unavailable, so an appropriate paired-samples test and effect size could not be recomputed. The results are consequently interpreted descriptively.

RESULT AND DISCUSSION

Results

The available summary data show higher descriptive writing scores after the four Mindomo-assisted sessions. The mean increased from 46.44 on the pretest to 77.72 on the posttest, producing a mean difference of 31.28 points. The reported mean N-gain was 57.06%.

Table 2. Descriptive Summary of Pretest and Posttest Performance

Indicator	Reported value
Number of students	19
Mean pretest score	46.44
Mean posttest score	77.72
Mean score difference	31.28 points
Mean N-gain	57.06%
Minimum N-gain	26.67%
Maximum N-gain	76.79%

Individual N-gain values ranged from 26.67% to 76.79%, indicating that the

magnitude of improvement varied across students. The available summary did not include standard deviations, individual paired scores, or component-level means. It is therefore not possible to determine the dispersion of scores, calculate a paired effect size, or establish whether content and organization improved more than grammar, vocabulary, or mechanics.

Classroom records indicated that students initially had difficulty expanding a topic, selecting vocabulary, and maintaining connections among ideas. During the instructional sessions, the maps gave students a visible starting point from which to select and order details before drafting. These observations help describe how the intervention was used, but they were not collected through a standardized observation instrument and should not be treated as independent outcome measures.

Discussion

The 31.28-point mean increase is consistent with the proposed function of mind mapping as a prewriting scaffold. By externalizing a central topic and its supporting details, the map can reduce the burden of generating and organizing content while sentences are being produced. Computerized mapping studies have reported their clearest benefits in content and organization, the dimensions most directly represented by a map (Sebit & Yildiz, 2020). Similar gains have been reported when mind maps were used for EFL descriptive writing (Tarin & Yawiloeng, 2022).

The digital format may have strengthened this planning function. Mindomo allowed students to add and rearrange details without reconstructing the entire plan. This flexibility is compatible with findings from mobile-assisted mapping, where learners used a portable planning environment to support writing performance (Abd Karim et al., 2021), and from online mind-mapping integrated with collaborative writing (Wu & Miller, 2021). Comparative research also indicates that electronic and manual mapping can both mediate EFL writing, with electronic formats offering particular advantages for revision and reorganization (Al-Inbari et al., 2023). The collaborative affordances of digital maps are also consistent with evidence that shared mapping artifacts can become focal points for meaning-making and idea development (Beal & Hontvedt, 2023; Fang et al., 2024).

Vocabulary is another plausible pathway. A descriptive map can group nouns, adjectives, verbs, and supporting phrases around the same topic, giving students a small lexical network to consult while drafting. Research has linked mind mapping with vocabulary recall, retention, motivation, and willingness to communicate (Feng et al., 2023).

The present dataset did not report vocabulary-component means, however, so this mechanism remains an instructionally plausible interpretation rather than a demonstrated component-level effect.

Mind mapping should therefore be embedded in a fuller writing process. Process-based instruction can strengthen learners' strategic regulation across planning, drafting, monitoring, and revision (Guo et al., 2021), while explicit self-regulated writing instruction can improve both strategy use and writing performance (Teng & Zhang, 2020). In practical terms, teachers should model a complete map, provide guided practice, require students to explain relationships among branches, and compare the finished paragraph with the map during revision.

The age and context of learners also matter. Recent work with middle-school EFL students found that scaffolded mind mapping supported lexical and grammatical complexity, accuracy, and fluency in narrative writing (Fu & Relyea, 2024). Early-2025 evidence from a technology-enhanced primary writing environment likewise supports mind maps as a prewriting activity (Mustika et al., 2025). These studies strengthen the rationale for visual planning but do not establish that Mindomo itself, rather than the broader mapping strategy and associated scaffolding, caused the change observed in the present class.

Interpretation must remain bounded by the design. With only one purposively selected class, improvement may reflect repeated practice, teacher guidance, task familiarity, maturation, or other classroom experiences. The unavailable paired scores and incomplete scoring documentation further prevent a valid inferential test and a reliability analysis. A future study should use equivalent writing prompts, at least two trained raters, reported inter-rater reliability, a comparison group, and a paired or mixed-model analysis suited to the data structure.

CONCLUSION

The descriptive results show substantial within-group improvement in the writing scores of 19 Grade XI students after four sessions of Mindomo-assisted mind mapping. The mean increased from 46.44 to 77.72, and the reported mean N-gain was 57.06%. In classroom use, Mindomo made the prewriting stage visible by helping students place a topic at the center, generate supporting details, organize those details into branches, and use the map as a guide while drafting. The evidence supports Mindomo as a promising pedagogical scaffold, not as a proven causal explanation for the score increase.

Pedagogical Implications and Limitations

Teachers can use Mindomo most productively when mapping is connected to explicit vocabulary support, sentence modeling, drafting, feedback, and revision. Students should be asked to justify categories, check whether every branch contributes relevant detail, and compare the final paragraph with the map. The study's small purposive sample, single-group design, incomplete scoring documentation, and unavailable paired dataset limit both generalization and causal inference. Replication with a comparison group, trained independent raters, reliability evidence, component-level results, and an appropriate paired analysis is required.

Recommendations

1. Use Mindomo as a guided prewriting scaffold rather than as a stand-alone activity.
2. Link each branch explicitly to vocabulary selection, sentence construction, and paragraph revision.
3. In future research, include a comparison condition and preserve student-level paired scores so that valid effect sizes and inferential tests can be reported.

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