

ENHANCING STUDENTS' PROCEDURE TEXT WRITING SKILLS THROUGH THE MIND MAPPING TECHNIQUE: A QUASI-EXPERIMENTAL STUDY

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Abstract

This research aimed to investigate the effectiveness of the mind mapping technique in improving the procedure text writing skills of twelfth-grade students at SMA Negeri 1 Dondo. The study employed a quantitative quasi-experimental design, involving an experimental group and a control group selected from the MIA classes. Data were collected through pre-tests and post-tests to measure students' writing proficiency in aspects such as organization, vocabulary, grammar, and mechanics. The findings demonstrated a significant improvement in the experimental group following the mind mapping treatment. Statistical analysis revealed that the t-counted value (5.490) was significantly higher than the t-table value (1.705) at the prescribed level of significance. This confirms that the mind mapping technique effectively helps students associate ideas, think creatively, and systematically organize their sentences, thereby overcoming the challenges of monotonous learning. In conclusion, the mind mapping technique is a highly effective instructional medium for teaching procedure text writing.

Keywords: Mind mapping technique, writing skills, procedure text, quasi-experimental research, EFL learners.

BACKGROUND

Writing is widely recognized as one of the most fundamental yet challenging language skills to master. As a medium of communication, writing requires learners not only to generate ideas but also to accurately translate them into written form so that the intended message is comprehensively understood by the audience (Peha, 2010). In the context of English as a Foreign Language (EFL), writing encourages students to focus on accurate language usage and structural coherence (Harmer, 2004). Based on the 2013 Curriculum for Senior High Schools in Indonesia, students are required to master various text genres, one of the most crucial being the procedure text. The communicative purpose of a procedure text is to systematically describe how something is made or accomplished through a sequence

of logical steps, demanding a firm grasp of generic structures (goals, materials, steps) and specific linguistic features.

Despite its importance, mastering procedure text writing remains a formidable obstacle for many students. Preliminary interviews conducted at SMA Negeri 1 Dondo revealed that twelfth-grade students repeatedly face difficulties in constructing cohesive procedure texts. The primary issues include an inability to write complete generic structures, inappropriate use of transitional conjunctions and adverbs, and a severe lack of vocabulary. These challenges are often exacerbated by conventional teaching methods that provide minimal opportunities for students to visually organize their thoughts before drafting their texts, leading to monotonous learning experiences and writing blocks.

To address these pedagogical issues, the implementation of the mind mapping technique offers a highly promising solution. Developed by Tony Buzan (1974), mind mapping is a visual outlining tool that sequences keywords into branches, enabling learners to associate ideas, think creatively, and establish logical connections between sentences. By mapping out their thoughts graphically, students can quickly identify the structure of a subject and seamlessly piece together unprocessed facts (Buzan, 2007).

The efficacy of mind mapping in writing instruction has been documented in several previous studies. For instance, Kusumayanthi and Malik (2022) and Mantra et al. (2021) demonstrated that mind mapping significantly improved students' descriptive writing skills and overall classroom engagement. Similarly, Simanjuntak et al. (2020) found that visual mapping strategies effectively elevated students' narrative writing achievements and lowered affective filters during the learning process. However, a distinct research gap remains. The majority of previous studies have predominantly focused on junior high school demographics, utilized Classroom Action Research designs, or centered on descriptive and narrative texts. There is a scarcity of empirical research utilizing a quasi-experimental design to explicitly measure the impact of mind mapping on the procedure text writing skills of senior high school students, particularly within science-tracked (MIA) classrooms.

To bridge this empirical gap, this research applies the mind mapping technique to a specific, under-researched demographic. Therefore, this study aims to investigate whether the use of the mind mapping technique significantly improves the procedure text writing skills of twelfth-grade students at SMA Negeri 1 Dondo.

LITERATURE REVIEW

Conceptualizing Writing Skills in the Context of EFL

Writing is widely recognized as one of the most complex language skills, as it requires a systematic cognitive process to encode messages into written form (Harmer, 2004). Unlike spoken language, which is often supported by visual context and gestures, written language requires writers to construct linguistic structures independently and accurately. According to Peha (2010), writing is essentially the process of communicating ideas with a specific purpose and directed at a particular audience. Therefore, the success of a written piece depends heavily on the extent to which readers can understand the ideas being conveyed. In the context of *English as a Foreign Language* (EFL) instruction, writing compels students to actively consider the use of accurate grammar, select appropriate vocabulary, and organize their train of thought coherently (Harmer, 2004).

Structure and Communicative Function of Procedural Texts

At the high school level, one of the essential text genres that students must master is the procedural text (*procedure text*). Procedural texts are fundamentally designed to guide readers on how to perform, create, or operate something through a series of logically organized steps (Anderson & Anderson, 1997). Structurally, a good procedural text must include three main generic structures: (1) *Goals/Aim* (the ultimate goal of the activity), (2) *Materials/Tools* (the materials or tools required), and (3) *Steps* (a chronological sequence of steps to achieve the goal) (Anderson & Anderson, 1997). Linguistically, composing this type of text requires students to master the use of imperative sentences, *temporal conjunctions*, and technical vocabulary relevant to the topic at hand. It is precisely these limitations in understanding structure

and vocabulary that often cause writing difficulties for students.

Mind Mapping as a Visual Cognitive Tool

To overcome writer's block and disorganized writing structure, visual cognitive approaches such as *mind mapping* are essential. First developed by cognitive psychologist Tony Buzan (1974), *mind mapping* is a technique for mapping information spatially and non-linearly that aligns with how the human brain naturally processes information. Buzan (2007) explains that through *mind mapping*, students can use a blank sheet of paper to draw the main idea in the center, then draw conceptual branches (containing keywords) in all directions. When teaching procedural texts, these visual branches greatly help students group materials and arrange chronological steps visually before they begin to assemble them into complete sentences. This technique effectively stimulates imagination, facilitates the association of ideas, and prevents *cognitive overload* during the sentence *drafting* process.

Synthesis of Previous Research and Research Position

Empirical exploration of the effectiveness of the *mind mapping* technique in writing instruction has been the primary focus of various studies from 2020 to 2023. A number of studies have confirmed that this technique is highly effective in addressing students' difficulties in organizing ideas in descriptive texts. Kusumayanthi and Malik (2022), through their descriptive qualitative study, found that the use of images, colors, and branches in *mind mapping* motivates vocational high school students to organize ideas for descriptive texts in a systematic and enjoyable way. These findings align with the Classroom Action Research (CAR) conducted by Mantra et al. (2021), which concluded that the mind mapping strategy successfully transformed monotonous writing instruction into an interactive

process, thereby significantly boosting EFL students' ability to write descriptive texts.

In addition to descriptive texts, the flexibility of the *mind mapping* method has also proven effective when applied to various text genres and combined with other media. In the context of news writing, Suwarti et al. (2020) demonstrated through a classroom action research study that integrating the *mind mapping* method with video media helped junior high school students more easily identify the elements of a news story. Furthermore, Nugroho et al. (2023) reported that *mind mapping* also successfully improved students' skills in composing explanatory texts by mapping the coherence of ideas and the cause-and-effect relationships of phenomena in a structured manner. Another innovation was carried out by Sairo et al. (2021), who used *digital mind mapping*; the use of software proved practical in helping students overcome confusion when beginning to write and reducing the problem of limited vocabulary. In the experimental realm, Simanjuntak et al. (2020) quantitatively demonstrated that this technique has a significant positive effect on 11th-grade students' skills in writing narrative texts compared to conventional methods.

Although the recent literature cited above has comprehensively confirmed the advantages of *mind mapping*, there is a crucial research *gap*. *First*, the majority of recent studies are still heavily dominated by Classroom Action Research (CAR) designs (Mantra et al., 2021; Nugroho et al., 2023; Sairo et al., 2021; Suwarti et al., 2020) or descriptive qualitative studies (Kusumayanthi & Malik, 2022). *Second*, the focus on text genres generally revolves around descriptive, narrative, news, or explanatory texts.

To date, it remains extremely rare to find studies that employ a quasi-experimental design to precisely test the effectiveness of *mind mapping* specifically on procedural texts (*procedure text*), particularly among the demographic of

twelfth-grade students in the science track (MIA). Procedural texts require strict chronological sequencing and the precise use of temporal conjunctions, for which visual mapping is theoretically ideal for outlining these *steps*. Therefore, this study aims to address this empirical gap by evaluating the effectiveness of the *mind mapping* technique on procedural text writing skills through a quasi-experimental approach at SMA Negeri 1 Dondo.

METHOD OF THE RESEARCH

Research Design

This study employed a quantitative approach with a quasi-experimental pre-test and post-test control group design. This design was selected to investigate the causal effect of the independent variable (the mind mapping technique) on the dependent variable (students' procedure text writing skills). Two groups were involved in this study: an experimental group that received writing instruction using the mind mapping technique, and a control group that was taught using conventional teaching methods.

Population and Sample

The research was conducted at SMA Negeri 1 Dondo. The population comprised 80 twelfth-grade students enrolled in the Science/Mathematics (MIA) track, divided into two classes (MIA 1 and MIA 2). To align with the intensive writing evaluation process and ensure statistical reliability, a sample of 28 students was drawn from the population. The sample was divided equally, assigning 14 students to the experimental group and 14 students to the control group.

Research Instrument

The primary instrument used for data collection was a written test, administered both as a pre-test and a post-test. The students were instructed to compose a procedure text based on predetermined topics (e.g., how to make specific foods or beverages). To ensure objective evaluation,

the students' writing products were assessed using an analytical scoring rubric adapted from Weigle (2002). The rubric specifically measures four writing components: Organization (overall shape and clear internal pattern), Vocabulary (appropriate lexical choices), Grammar (accuracy of language structure), and Mechanics (punctuation, capitalization, and spelling).

Data Collection Procedure

The data collection was systematically carried out in three stages. First, a pre-test was administered to both groups to measure the students' baseline writing proficiency before any intervention. Second, the treatment was conducted over six meetings. In the experimental group, students were taught how to construct procedure texts (covering topics such as making juices, traditional foods, and healthy meals) using Tony Buzan's (1974) mind mapping technique. During these sessions, students were guided to use blank paper and colored pens to draw a central image representing the main topic, and then connect curved branches representing sub-topics (materials and steps) using specific keywords and symbols. Meanwhile, the control group received standard, non-visual writing instruction. Finally, a post-test, identical in format to the pre-test, was administered to both groups to evaluate their writing skill improvement.

Data Analysis Technique

The data obtained from the pre-test and post-test were analyzed quantitatively using descriptive and inferential statistics. Initially, individual standard scores were calculated based on the four components of the writing rubric. Descriptive statistics were then used to determine the mean scores and the sum of squared deviations for both the experimental and control groups. To test the research hypothesis and determine whether the improvement in the experimental group was statistically significant compared to the control group, an independent sample t-test

was performed. The resulting t-counted value was compared against the critical t-table value at a 0.05 level of significance to draw the final conclusion

FINDING AND DISCUSSION

Findings

The data for this research were collected quantitatively through a pre-test and a post-test administered to both the experimental and control groups. The tests measured the students' writing proficiency in composing procedure texts before and after the implementation of the mind mapping treatment.

Baseline Scores (Pre-Test)

Before the treatment, a pre-test was administered to evaluate the students' baseline writing skills. In the control group, the highest score achieved was 87.00, while the lowest score was 77.30. The accumulated score for the 14 students in the control group was 1,146, resulting in a pre-test mean score of 81.90. This indicated that while students possessed a basic understanding of English, their procedural writing skills required further enhancement.

Post-Test Results

Following the instructional period, a post-test was administered. The experimental group, which was taught using the mind mapping technique, achieved a post-test mean score of 92.00. In contrast, the control group, which received conventional instruction, obtained a total accumulated score of 1,220.6. The highest post-test score in the control group was 92.30, and the lowest was 82.20, resulting in a post-test mean score of 87.20. A comparison of the means clearly illustrates that the experimental group (92.00) outperformed the control group (87.20).

Hypothesis Testing

To determine the statistical significance of the improvement, an independent t-test was conducted. The calculation revealed that the t-counted value was 5.490. This value was then compared to the t-table value at a 0.05 level of significance, which was 1.705. Since the t-counted value (5.490) was significantly higher than the t-table value (1.705), the alternative hypothesis was accepted. This statistically confirms that the mind mapping technique significantly improved the students' procedure text writing skills.

Discussion

The statistical findings firmly establish that the integration of the mind mapping technique yields a highly significant improvement in the procedure text writing skills of twelfth-grade students at SMA Negeri 1 Dondo. The experimental group's superior post-test mean score (92.00) compared to the control group (87.20) provides robust empirical evidence that visual outlining tools are more effective than conventional, text-heavy instructional methods.

The success of this intervention can be explained through the cognitive framework proposed by Tony Buzan (1974). Mind mapping aligns with the brain's natural tendency to associate information spatially rather than linearly. In writing a procedure text, students are required to systematically present materials and chronological steps. By using central images, branches, and keywords, the students in the experimental group were able to visually map out the ingredients and the sequential actions before drafting their paragraphs. This visual scaffolding effectively prevented cognitive overload, allowing students to focus on grammatical accuracy and mechanical precision during the actual writing phase.

Furthermore, these findings strongly corroborate recent empirical studies in EFL writing instruction. The significant improvement observed aligns with the

findings of Nugroho et al. (2023), who emphasized that graphic representation helps learners map logical relationships and chronological events in structured texts. Additionally, the heightened student engagement observed during the treatment reflects the conclusions drawn by Mantra et al. (2021) and Simanjuntak et al. (2020), which state that visual mapping strategies successfully transform monotonous learning, reduce writing anxiety, and foster spontaneous idea generation.

Unlike the control group, where students often experienced writer's block due to the monotonous nature of conventional drafting, the experimental group utilized the mind mapping technique to seamlessly transition from abstract ideas to well-structured procedure texts. Ultimately, this study successfully addresses the existing research gap by proving that manual mind mapping is not only effective for descriptive texts in junior high schools, but is also a highly potent cognitive tool for mastering complex procedural writing among senior high school students in science-tracked classrooms.

CONCLUSION AND SUGGESTION

Conclusion

Based on the statistical analysis and the findings of this study, it is concluded that the implementation of the mind mapping technique significantly improves the procedure text writing skills of twelfth-grade students at SMA Negeri 1 Dondo. The empirical data demonstrated a substantial increase in the experimental group's writing proficiency, with the t-counted value (5.490) significantly exceeding the t-table critical value (1.705). This strictly confirms the acceptance of the alternative hypothesis. The mind mapping technique serves as an effective cognitive tool that assists students in visually associating ideas, structuring

chronological steps, and reducing cognitive overload prior to drafting. Consequently, students are able to produce procedure texts with better organization, more appropriate vocabulary, and accurate grammatical mechanics.

Suggestion

Based on the empirical findings and the pedagogical implications discussed, the following recommendations are proposed:

- (1) **For English Teachers:** Teachers are strongly encouraged to integrate the mind mapping technique as an interactive visual aid in teaching writing. Utilizing this technique helps to attract students' motivation, reduce boredom from monotonous learning, and provide a clear scaffold for students to organize their ideas before drafting complex texts.
- (2) **For Students:** Students are expected to actively engage in the pre-writing stage by utilizing mind maps to explore their ideas. By mapping out their thoughts graphically, students can boost their confidence in writing, easily recall necessary vocabulary, and systematically organize the generic structures of a procedure text.

For Future Researchers: The results of this study can be used as empirical baseline information for implementing mind mapping in writing classrooms. Future researchers are encouraged to explore the effectiveness of this technique across different text genres, larger sample sizes, or by integrating digital mind mapping software to further enhance students' writing achievements in the modern digital era.

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