

The Effectiveness of Spider Diagrams in Improving Descriptive Writing Skills of 7th Grade Students

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Abstrak

Penelitian ini bertujuan untuk menguji efektivitas penggunaan *spider diagrams* dalam meningkatkan keterampilan menulis deskriptif siswa kelas VII di sebuah sekolah menengah pertama di Jombang. Penelitian ini menggunakan desain kuasi-eksperimen dengan melibatkan 56 siswa yang dipilih melalui teknik *purposive cluster sampling* dan dibagi menjadi kelompok eksperimen (yang diajar menggunakan *spider diagrams*) dan kelompok kontrol (yang diajar menggunakan metode tradisional). Keterampilan menulis deskriptif siswa diukur melalui pre-test dan post-test menggunakan rubrik Jacobs et al. (1981) yang mencakup aspek konten, organisasi, kosakata, penggunaan bahasa, dan mekanika. Hasil uji Mann-Whitney U menunjukkan adanya perbedaan yang signifikan ($p = 0,001$) pada skor post-test, di mana kelompok eksperimen menunjukkan peningkatan yang lebih tinggi. Peningkatan tertinggi terdapat pada aspek konten ($M = 27,07$) dan penggunaan bahasa ($M = 21,17$), sedangkan peningkatan terendah terdapat pada aspek mekanika ($M = 3,77$). Temuan ini menunjukkan bahwa *spider diagrams* merupakan strategi visual yang efektif untuk meningkatkan keterampilan menulis siswa, khususnya dalam pengembangan ide dan pengorganisasian tulisan. Penelitian selanjutnya disarankan untuk mengintegrasikan *spider diagrams* dengan strategi pembelajaran lain guna meningkatkan aspek teknis penulisan, seperti mekanika dan kosakata.

Kata Kunci: Diagram laba-laba, penulisan deskriptif, Bahasa Inggris sebagai bahasa asing (EFL), siswa sekolah menengah

Abstract

This study aims to test the effectiveness of using spider diagrams in improving descriptive writing skills of seventh-grade students at a junior high school in Jombang. This study used a quasi-experimental design involving 56 students selected through purposive cluster sampling technique and divided into an experimental group (taught using spider diagrams) and a control group (taught using traditional methods). Students' descriptive writing skills were measured through a pre-test and post-test using Jacobs et al.'s (1981) rubric covering aspects of content, organization, vocabulary, language use, and mechanics. The results of the Mann-Whitney U test showed a significant difference ($p = 0.001$) in post-test scores, where the experimental group showed a higher improvement. The highest improvement was in the content ($M = 27.07$) and language use ($M = 21.17$) aspects, while the lowest improvement was in the mechanics aspect ($M = 3.77$). These findings indicate that spider diagrams are an effective visual strategy for improving students' writing skills, especially in developing ideas and organizing writing. Further research is recommended to integrate spider diagrams with other learning strategies to improve technical aspects of writing, such as mechanics and vocabulary.

Keywords: Spider diagram, descriptive writing, EFL learning, junior high school students

INTRODUCTION

In English language learning, writing is one of the important skills that junior high school students must be able to know and understand. Yet, it is frequently seen as the most difficult skill for them to master. Hermansyah and Sudirman (2019) state that writing requires students to organize their thoughts and language into cohesive sentences and paragraphs. At the end of the first

semester, the seventh-grade students should be able to produce descriptive text. This text allows students to use sensory details to explain many things around them, convey their thoughts more clearly, and build critical thinking skills (Asiah et al., 2020; Permatasari, 2023).

Learning in the Merdeka Curriculum is based on a constructivist approach, in which students actively construct knowledge through their experiences. Teachers are not to be the center, but rather serve as facilitators,

guiding students throughout the learning process (Prakash Chand, 2023). Several theories support this method. Piaget, for example, focuses on active learning, Vygotsky emphasizes social interaction and the Zone of Proximal Development (ZPD), and Bruner emphasizes directed learning. According to these theories, students learn better when they actively organize and develop knowledge directly while experiencing it.

However, according to prior observations at a junior high school in Jombang, seventh-grade students had difficulty arranging thoughts clearly and producing good descriptive text. They faced challenges, such as a restricted vocabulary, poor understanding of grammar, and an inability to organize ideas into clear thoughts. In addition, the students feel unmotivated to write due to the use of repetitive teaching methods and the lack of engaging pre-writing strategies that are provided by the teacher. It makes it difficult for them to develop ideas (Kadek et al., 2018).

To solve these challenges, it will be better to consider the visual learning methods. According to Buzan and Buzan (1994), a mind map is a visual tool used to organize concepts. One of the kinds is named spider diagrams. Spider diagrams, with their simple structure of a central main idea and branching sub-ideas, are suitable for seventh-grade students who are just beginning to use mind mapping techniques. This helps students connect and organize data, optimize right and left-brain functions, and ultimately improve their writing skills by providing a structured reference for descriptive writing (Kadek et al., 2018).

According to constructivist theory, spider diagrams help students actively organize their ideas and relate new material to past knowledge. This makes the learning experience more meaningful and structured.

Previous studies have also explored the use of mind maps in improving writing skills. Hermansyah & Sudirman (2019) and Kadek et al. (2018) found significant improvements in the descriptive writing outcomes of 8th-grade junior high school students after using mind maps. Pratiwi & Muth'im (2023) also demonstrated that mind mapping is more effective than other methods in improving students' descriptive writing, though they did not specify the type of mind map used. In the context of narrative writing, Rahmawati et al. (2018) used Story Map for EFL students, while Vejayan & Md. Yunus (2022) utilized MINDOMO for ESL students. LUO Mingli (2019) even found mind maps effective in improving argumentative essay writing among Mandarin-speaking university students.

However, there is a significant research gap. Most previous studies, such as those conducted by Rahmawati et al. (2018) and Vejayan & Md. Yunus (2022), focused

on ESL students or higher education levels, who have different English language abilities than 7th-grade EFL students. Styati & Irawati (2020) did conduct a similar quasi-experimental study on the descriptive writing of junior high school students in Indonesia, but did not specify which aspects of writing (content, organization, vocabulary, language use, and mechanics) improved the most. From these research gaps, there is a need for further research that focuses on the effectiveness of spider diagrams for seventh-grade EFL students, with a more detailed analysis of five aspects of descriptive writing.

Based on the background and identification of research gaps, this study aims to answer two main questions: (1) Does the use of spider diagrams have a significant effect on the descriptive writing skills of 7th-grade students? (2) Which aspects of descriptive writing improved the most in 7th-grade students after using spider diagrams?

In the theoretical context, these findings will add some explanation about constructivist theory in English language learning by demonstrating how visual tools can facilitate cognitive processes in the students. On the other hand, in a practical situation, this research is expected to provide teachers with references on different yet innovative and systematic writing teaching strategies in line with the Merdeka Curriculum. For students, the results of this research can help them to overcome writing difficulties and anxiety, boost confidence, and produce more cohesive and structured writing within a limited learning period.

METHODS

To test the efficiency of spider diagrams in improving students' descriptive writing ability, a quantitative approach, especially a quasi-experimental design, is used in this research. This approach is considered easier to implement in a limited timeframe, as it only involves comparing two groups: the group receiving a specific treatment (experimental group) and the group with no specific treatment (control group). The research population consisted of seventh-grade students at a junior high school in Jombang, from which 56 students were selected using purposive cluster sampling, divided into 30 students in the experimental group and 26 students in the control group.

The main instrument used was a descriptive writing test (pre-test and post-test) to measure students' abilities in five aspects: content, organization, vocabulary, language use, and mechanics. The assessment was based on the rubric by Jacobs et al. (1981). The reliability of this rubric was very good, as evidenced by a Cronbach's Alpha value of 0.920 and a Corrected Item-Total

Correlation for each aspect above 0.30, indicating strong internal consistency.

The data collection process was conducted during four sessions. The first session was set up to administer the pre-tests to both groups. In the second and third sessions, the experimental group received instructional intervention using spider diagrams to help in the pre-writing process and idea generation, whereas the control group was taught using traditional methods such as teacher-centered instruction, explanation of descriptive text structures, and individual writing tasks that did not include visual or pre-writing strategies such as mind mapping. Finally, in the fourth session, a post-test was given to assess both groups' progress in descriptive writing skills.

Data was analyzed statistically using SPSS Version 25. The Shapiro-Wilk normality test revealed that the data were not normally distributed ($p < 0.05$). To compare post-test scores between groups, the Mann-Whitney U test was used with a significance threshold of 0.05. The effect sizes were estimated using the Rank Biserial Correlation. To determine which aspects of writing improved the most, descriptive analysis (mean) was done on the experimental group's pre-test and post-test scores in each aspect of writing.

RESULTS AND DISCUSSION

Pre-test and post-test data analysis revealed that descriptive writing scores of both experimental and control groups were not normally distributed (Shapiro-Wilk test: $p < 0.05$). As a result, a non-parametric test was conducted.

The Mann-Whitney U test found a statistically significant difference ($p = 0.001$) between the experimental group (taught using spider diagrams) and the control group (taught using conventional methods). The experimental group's average score (35.52) was significantly higher than the control group's (20.40). Table 1 shows the Mann-Whitney U test findings that compare post-test scores between the experimental and control groups.

Table 1:
 Mann-Whitney U Test Results for Post-test Scores

Post-Test Result	Mann-Whitney Test				Ho
	U	Mean Rank	Z	Asymp. Sig. (2-tailed)	
179.5		20.40 (Control)	-3.469	0.001	Rejected
		35.52 (Experimental)			

The results indicate a statistically significant difference between the two groups ($p = 0.001$), with the experimental group achieving higher scores.

In addition, the calculation of the effect size using Rank Biserial Correlation produced a value of $r_{rb} = 0.5397$, which, according to Cohen's Interpretation (1988), indicates a moderate to large significant effect of the treatment. This further reinforces that seventh-grade students taught using the spider diagrams produced significantly better descriptive texts than those taught conventionally. Table 2 presents the effect size of the treatment using the rank-biserial correlation.

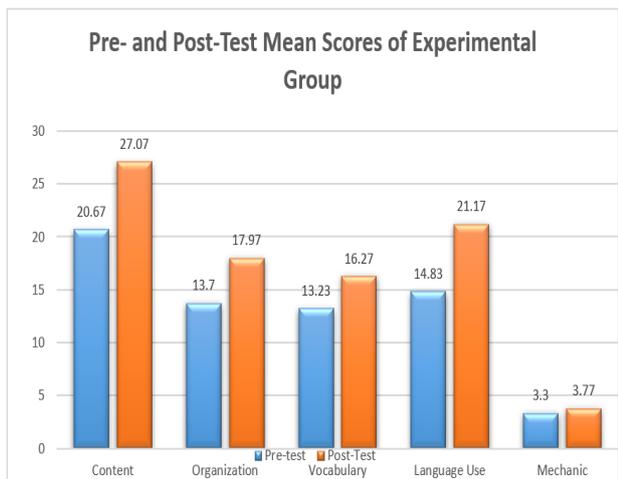
Table 2:
 Effect Size of the Treatment (Rank-Biserial Correlation)

$r_{rb} = 1 - \frac{2U}{n1.n2}$
Notes:
r_{rb} = rank biserial correlation
1 = constanta
U = Mann-Whitney U value
n1 = control group sample
n2 = experimental group sample
$r_{rb} = 1 - \frac{2 \times 179.5}{26 \times 30}$
$r_{rb} = 1 - \frac{359}{780}$
$r_{rb} = 1 - 0.4603$
$r_{rb} = 0.5397$

The result shows that the rank-biserial correlation value is 0.5397, which indicates a moderate to large effect based on Cohen's (1988) interpretation. This suggests that the use of spider diagrams has a meaningful impact on students' descriptive writing skills. The ability of the experimental group that was routinely given the spider diagram treatment was proven to improve, as seen from their descriptive texts, which showed a development in their skill to organize ideas into a text that could be read clearly.

To identify which aspects of writing improved the most, a descriptive analysis was conducted. Table 3 presents the pre-test and post-test mean scores of each writing aspect in the experimental group.

Table 3:
Pre-test and Post-test Mean Scores of Writing Aspects in the Experimental Group



The table shows that all aspects of writing are improved, with the greatest improvement in language use and content, while mechanics showed the lowest improvement.

The content aspect improved from a pre-test average score of 20.67 to 27.07 on the post-test (21% increase), showing students' ability to produce and elaborate their ideas on descriptive text. Meanwhile, the language use aspect increased by 25%, from 14.83 to 21.17, indicating a significant improvement in sentence structure, word choice, and grammatical accuracy. The organization aspect also increased by 21%. The vocabulary increase was 15%. However, the mechanical part (spelling and punctuation) improved the least, by 9%, with an average pre-test score of 3.3 and a post-test score of 3.77.

The results of this study show that seventh-grade students' descriptive writing abilities are improved by spider diagrams. These findings are in line with a previous study by Styati and Irawati (2020), which discovered that students who used graphic organizers performed better in aspects of writing quality, such as content, vocabulary, and mechanics.

This research also supports LUO Mingli's (2019) claim that mind maps can be a useful tool for students to express their thoughts completely and clearly, because they combine pictures and words, and make their brain stimulated to visualize something. This is very good for their right human brain, which focuses on creative thinking. In practice, spider diagrams help students in imagining and describing main ideas into smaller details before writing, allowing for more comprehensive elaboration, and minimizing the anxiety that typically comes with writing.

The effectiveness of spider diagrams can also be explained through the constructivist learning theory and a process-based approach to writing. Three experts of this theory, who are Vygotsky, Bruner, and Piaget, claim that students can understand better through active learning, social interaction, and the use of meaningful tools to complete tasks. In this context, spider diagrams act as cognitive tools that help students make a connection between new learning material about descriptive concepts and existing knowledge that they already know, and then they organize ideas visually. This explanation is similar to Vygotsky's Zone of Proximal Development (ZPD), in which students can achieve better with the right guidance and support from older people or a teacher. They are not just following the teacher's guidance but also experimenting directly with some tools. This writing education approach is based on Hyland's (2008) process-genre model, which argues that the process from preparation to editing must be carried out in a structured manner. Spider diagrams help students to organize and connect their thoughts during the planning stage of the writing process, makes their text is more structured and consistent with the rules of the genre.

The most remarkable improvements in content and language use confirm that spider diagrams are effective in supporting idea development. This shows that the students are able to develop better sentence structure and logical flow in their writing because the diagram can visualize the relationships between ideas. This improvement is consistent with Jacobs et al. (1981), who believe that content elaboration is an important indicator of excellent writing, and Hermansyah & Sudirman (2019), who discovered that visual mapping strategies support descriptive content development. However, there is still a limitation to this research. The findings of this research show that vocabulary improvement is likely average, while the improvement in mechanics is relatively low. This indicates that, while spider diagrams are useful for idea generation and organizing, they are less effective for technical features like spelling and punctuation. It can be noted for future researchers that spider diagrams should be used in combination with other teaching strategies that focus on areas where improvement is still limited, so that all aspects of writing can be improved together by the spider diagrams, and the students' descriptive text can be produced better.

CONCLUSION

This study investigates the effectiveness of spider diagrams in improving descriptive writing skills among seventh-grade students at a junior high school in Jombang. The data analysis results show that students who used spider diagrams improved their descriptive

writing skills more than those who were taught using traditional methods, such as a teacher-centered learning process and direct explanation of descriptive text. This finding is proven by the Mann-Whitney U test, which found a statistically significant difference ($p = 0.001$) between the two groups after intervention.

In addition, spider diagrams were found to be highly helpful and recommended in supporting improvements in the content and language use aspects of students' descriptive writing. It is shown that the students consider the spider diagrams as a visual guidance for developing their ideas and producing more coherent and cohesive sentences. However, it should be noted that the mechanical aspects (including spelling and punctuation) are seen to be the least improved. This suggests that, while spider diagrams are quite useful for conceptual and structural parts of writing, paying attention to technical details will require additional strategies. The teacher must combine spider diagrams with other teaching strategies to make students more interested and improve all aspects of writing.

Based on these findings, it is strongly recommended that teachers consider integrating the spider diagrams technique into their writing process exercises, particularly for descriptive writing. This diagram can be an effective tool for supporting students during the pre-writing and concept organization stages. To achieve more comprehensive improvements in all parts of writing skills, including the mechanical aspects that continue to be a challenge, teachers must combine spider diagrams with additional teaching strategies that especially focus on technical writing specifics.

For future researchers, this study enables opportunities for further exploration. It is recommended that different forms of mind maps be investigated, as well as combinations of various pre-writing strategies, in order to gain a more complete understanding of their impact on students' writing skills. Furthermore, extending the study's duration may provide more in-depth insights into the long-term development and retention of students' writing skills, as well as allow for the observation of more subtle changes in each aspect of writing.

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