

## THE IMPACT OF USING MINDOMO ON HIGH SCHOOL STUDENTS' ANALYTICAL EXPOSITION TEXT

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### Abstract

Students often experience difficulties in writing analytical exposition text, especially in conveying their thoughts in a coherent and organized form. To address this problem, Mindomo was implemented to help students organize their writing. This research aims to find out the impact of using Mindomo as a digital mind mapping tool on high school students' analytical exposition text writing by conducting quasi-experimental research. The implementation focused on two 10th grade classes of a Public Islamic High School in Ngawi, divided into one control class and one experimental class consisting of 30 students each. Each class underwent five sessions, starting with a pre-test, then the experimental class underwent treatment using Mindomo while the control class underwent learning using manual mind mapping, and ended with a post-test. The result shows experimental class's average post-test score increased to 83.79 after Mindomo implementation, up from a pre-test average of 75.20. Despite this gain, the hypothesis test (0.801) indicated no statistically significant difference between the control and experimental classes. This study found new information that the use of Mindomo in writing analytical exposition text in 10th grade has insignificant results.

**Keywords:** Analytical Exposition Text, Mind Map, Mindomo

## INTRODUCTION

Learning writing is important as it allows students to deliver what their thought without causing confusion and misunderstandings (Moldabayeva, Odanova, Nurmhametova, Bekbossynova, & Shakhmetova, 2023). Apart from that, writing provides benefits to students, because writing encourage students to think critically, learned to organize ideas, and helps them to communicate clearly (Ly, Nguyen, Phan, Dinh, & Huynh, 2021). It allows students to engage with language on a deeper level as it enables students to engage with language more profoundly by offering possibilities for practical application (Yiming, 2023) and helping them to develop their linguistic abilities through constructing written texts (Fitria, 2024). Therefore, it can be concluded that mastering writing skill is important for high school students.

Since writing requires a variety of skills, including engaging in creative thought, problem-solving, critical analysis, reflection, and revision to create a finalized written product, students frequently find it difficult (Demneri, 2024). Students have significant challenges when obtaining to articulate their thoughts in coherent written English (Luan, Rajendran, Subramanian, Jaisankar, & Oli, 2024). Research by Rizaldi, Mukrim, and Hastini (2022) indicated that students encounter challenges in identifying and articulating the major idea, resulting in difficulties in translating their thoughts into writing due to their inadequate ability to select a distinct main idea for their essays. In the process of writing the students may also face writer's block and lack of motivation (Hasan, Habibie, & Helingo, 2023). This happens because students struggle to create coherent texts, connected sentences and paragraphs, making smooth transitions between their ideas. This difficulty in linking ideas logically is a major reason they get stuck when writing (Zorba, 2023).

Due to the challenges associated with writing, students frequently makes mistakes in their compositions (Wahyuni, 2021). These obstacles prevent students from generating coherent, organized, and thoroughly developed texts. Additionally, preliminary investigation at Islamic public senior high school in Ngawi revealed that the students' writing abilities were lacking. Through an interview, the English teacher discovered that students had trouble writing entire analytical exposition texts, particularly when it comes to creating comprehensive and coherent sentences and organize their text. Moreover, the teacher also said that students require assistance in comprehending the art of writing analytical exposition texts

To deal with students' difficulties in organizing thoughts, mind mapping is often used in the writing process. Mind mapping functions as a visual tool that gives students in-depth understanding of concepts and subject areas, helps them connect different fields, and reinforces their knowledge (Le, Le, Ngo, & Tran, 2023). In addition, mind maps have been recognized as a useful tool for improving students' ability to generate a coherent and proficient mental process that can then be translated into written language (Astiantih & Akfan, 2023). It impacted students' creativity, organization, and learning productivity (Susanti Rahman & Hasan, 2024). Mind map also stimulates additional brain processes to arrange learning, produce brief and engaging notes, and introduce topic-related vocabulary (Sabarun, Muslimah, Muhanif, & Elhawwa, 2021). Moreover, mind maps have a positive impact on students' writing and are useful for helping them review drafts of their writing and revise them based on the ideas presented in the mind map (Al-Inbari, Al-Wasy, Mahdi, & Al-Nofaie, 2023). Thus, mind mapping's visual component supports in the logical structure of writers' ideas, resulting in work that is more logically ordered and cohesive. It has been demonstrated that this method greatly enhances writing abilities.

Mind maps which were previously used in physical form, can be accessed and used via the web and applications that can be downloaded on electronic devices. Mindomo is a digital mind mapping application intended to assist users in visually structuring content prior to composition. The features in Mindomo can support students to create and develop mind maps before writing a text. The use Mindomo as digital mind mapping has been proven to have positive impact on writing that helps students to structure texts in more organized manner with a clear conceptual structure (Chalak & Rastgoo, 2021). Moreover, using Mindomo to teach writing could support students improve their logical writing skills. The findings support the idea that using Mindomo software in writing lessons aids students in more successfully developing their papers logically (Naghmeh-Abbaspoura, Rastgoob, Fathic, & Yekd, 2019). Another research findings indicate that students enhanced their descriptive writing skills with Mindomo application. It also can increase students' enthusiasm for creating descriptive text (Rahmasari, Ekawati, & Sumartono, 2024). Similarly, findings from Mayusandra (2023) reveals that the use of Mindomo in the classroom allows students to brainstorm idea collectively. The result of the test shows improvement score of students from pre-test to post-test means mind mapping has a beneficial impact on writing processes. These findings indicate that incorporating Mindomo into writing training not only augments students' capacity to organize and articulate ideas but also elevates their overall writing quality. Mindomo facilitates the generation of clear and well-developed writings for students through an organized yet adaptable method of brainstorming and planning.

Although there were evidences that Mindomo as a digital mind map can help students' writing process, previous research has not directly examined how this tool affects the improvement of analytical exposition text writing skills. The number of subjects in previous studies were under 50 people (Chalak & Rastgoo, 2021). There was one study that only involved female students as subjects and the findings explained in the study were not statistically significant (Naghmeh-Abbaspoura et al., 2019). To address this gap, the present research employed a quasi-experimental method to implement Mindomo as a digital mind

mapping tool. This intervention sought to assist 60 students of both genders in organizing their writing and enhancing their analytical exposition text writing skills. This study focused to investigate this question: “Is there any significant impact of using Mindomo on 10th grade students’ written analytical exposition text?”

## **METHOD**

This study employed a quasi-experimental design. This design suitable for this research considering it can be used to investigate the cause and effect of Mindomo without requiring complete randomization which can be challenging to accomplish in the school due to factors like scheduling. This research focused on two classes divided into control class and experimental class. Each consist of 30 students. The control class used manual mind mapping in the learning process, while experimental class used Mindomo as a digital mind mapping tool. The study was conducted at the Public Islamic Senior High School in Ngawi in five sessions during the second semester of the 2024/2025 academic year.

The instruments that used in this research were in essay form where students were asked to create analytical exposition text according to the language features and generic structure. This test was developed based on the learning objectives contained in the English textbook for 10th grade students and raised topics about art that are adapted to the contents of the textbook. The tests were divided into two sections: pre-test and post-test used to evaluate the impact of using Mindomo on high school students’ analytical exposition writing and assessed using rubric adapted from Dirgeyasa (2017).

Data analysis was performed using SPSS 25, beginning with preliminary tests to determine the appropriate hypothesis testing method. A Shapiro-Wilk test was conducted to assess data normality, with a p-value threshold of 0.05 used to evaluate the null hypothesis of normal distribution. Subsequently, Levene’s test was employed to examine the homogeneity of variances between groups, also using a 0.05 significance level to assess the null hypothesis of equal variances. Based on the outcomes of these preliminary tests, the Mann-Whitney U test was selected for hypothesis testing, as it is a non-parametric test suitable for comparing two independent samples when normality assumptions are not met. Finally, rank biserial correlation were applied to calculate and interpret the effect size, quantifying the impact of the intervention on student writing ability.

## **FINDINGS AND DISCUSSION**

### **Findings**

#### ***Analysis of Mindomo’s Impact***

Following the completion of the data gathering process, a normality test was carried out in order to check whether or not the data follows a normal distribution and to determine the most suitable method of analysis. The data that can be found in table 3.7 of the previous chapter shows two data that are not normally distributed. This is due to the fact that the values are below the alpha threshold of 0.05 ( $p = 0.009$ ) and ( $p = 0.006$ ). The test results from the pre-test and post-test of both the experimental class and the control class were then analyzed using the Mann-Whitney U Test in order to determine whether or not there were any significant differences found in the pretest results between the control class and the experimental class.

The data were processed using SPSS 25 and the average results of the pre-test between the two classes are shown below:

Table 1. Pre-Test Mean Score

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Pre-test Control	30	56.07	90.91	74.7500	9.39261
Pre-test Experimental	30	60.61	89.40	75.2045	6.94241
Valid N (listwise)	30				

The data indicates that both the control class and the experimental class consist of an equal number of students, totaling 30 students in each class. The control class achieved an average score of 74.75. The minimum score recorded on the test was 56.07, while the maximum score reached was 90.91. The experimental class achieved a marginally higher average of 75.20, with a minimum score of 60.61 and a maximum score of 89.40. It indicates a minimal difference between the averages of the control class and the experimental class in the pre-test.

The pre-test results for the two classes were analyzed using the non-parametric Mann Whitney U test to determine if there was a significant difference between their pre-test outcomes. The outcomes of the computation are presented in the subsequent table:

Table 2. Result of Mann Whitney U Test for Pre-Test

Test Statistics <sup>a</sup>	
	Result of Pre-test
Mann-Whitney U	424.500
Wilcoxon W	889.500
Z	-.378
Asymp. Sig. (2-tailed)	.705

a. Grouping Variable: Class

The findings of the Mann-Whitney U test show that the pre-test scores of the students in the experimental and control groups did not differ statistically significantly. This indicates that prior to the treatment, the writing proficiency of both groups was comparatively similar. Practically speaking, the lack of substantial difference implies that any improvements seen later in the trial are more likely to be attributable to the treatment than to capacity differences that already existed. As a result, the two groups can be regarded as equal at baseline, strengthening the validity of the comparisons that follow the intervention.

After the pre-test was conducted on the control class and the experimental class, the experimental class received treatment using the Mindomo application as a digital mind mapping to write analytical exposition text. The use of Mindomo was carried out in the second meeting. Students were asked to use Mindomo application to create a mind map with a theme related to art. Students were free to organize their argument points and add any media to the

mind map to enhance their visualization of the argument. In the third and fourth meetings, they compiled an analytical exposition text based on the mind map they had created. The control class also conducted similar learning using the mind map manual.

After each class's treatment session ended, they were each given a post-test. At this stage, we want to know whether anything changed following the introduction of Mindomo. In the following table, you can see the average post-test results of both the control and experimental classes:

Table 3. Post-Test Mean Score

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Post-test Control	30	53.04	96.97	81.6180	13.40218
Post-test Experimental	30	62.13	96.97	83.7895	10.16020
Valid N (listwise)	30				

According to the data presented above, the mean scores of both classes showed an increase when compared to the scores obtained on the pretest. An average of 81.62 was obtained by the control group, with the lowest possible score being 53.04 and the best possible score being 96.07. The experimental class, on the other hand, achieved a slightly higher average, which was 83.79, after the treatment session was carried out. The score that was the lowest was 62.13, and the score that was the highest was 96.97, which is the same as the score that was given.

However, the experimental class demonstrated slightly stronger overall performance. Despite the small mean difference (2.17 points) between the two groups, the experimental class's higher minimum and average scores indicate that the treatment helped the students achieve better and more consistent results. Although the degree of improvement was not very significant, these findings suggest that the treatment had a favorable impact on students' post-test performance.

To ascertain whether or not there was a significant difference between the two classes' pre-test results, the post-test results were then compared using the non-parametric Mann Whitney U test. The outcomes of the calculation are presented in the table that can be seen underneath:

Table 4. Result of Mann Whitney U Test for Post-Test

Test Statistics <sup>a</sup>	
	Result of Post-test
Mann-Whitney U	433.000
Wilcoxon W	898.000
Z	-.252
Asymp. Sig. (2-tailed)	.801

a. Grouping Variable: Class

The results of the Mann Whitney U test calculation in the table 4, show that the significance was 0.801. This indicates that the post-test results of the control class and the experimental class are not significantly different, as the significance level (0.801) exceeds alpha (0.05). The null hypothesis is not rejected in accordance with Cohen's (2017) guideline. The post-test results showed an average difference of 2.17 points, which was descriptively significant; the result was not statistically significant.

After determining whether there is a significant difference between the two groups, it is important to calculate the effect size to find out how much influence the implementation of Mindomo had on the ability of students in the experimental group to write analytical exposition texts. Information on the impact of the independent variable on the dependent variable was provided by the effect size. (Creswell, 2020). The effect size was calculated in this study using rank biserial correlation based on the Z statistic to characterize the magnitude of the effect on the implementation of Mindomo with the formula  $r = \frac{Z}{\sqrt{N}}$ .

$$r = \frac{Z}{\sqrt{N}} = \frac{0.252}{\sqrt{60}} = \frac{0.252}{7.746} = 0.033$$

Table 5. Category of Effect Size

Range Score	Category
0.1	Small Effect
0.3	Medium Effect
0.5	Large Effect

The  $r$  value that was determined by the calculation of the effect size was found to be 0.033. A small effect size is indicated by a  $r$  value that is less than 0.1, according to Cohen's (2017) standards. This is in line with the findings of the significance test.

## Discussion

Based on the findings of the analysis presented above, it is possible to draw the conclusion that the implementation of Mindomo as a digital mind mapping to the treatment of the experimental class does not have a significant influence in comparison to the control class, which practices the use of manual mind maps. The response to the research question that there is no substantial impact of utilizing Mindomo on the written analytical exposition text generated by students in the tenth grade is provided by this. In this investigation, the null hypothesis was not successfully rejected.

The level of significance of this study that are not statistically significant support the results of research by Naghmeh-Abbaspoura et al. (2019) which stated that the use of Mindomo helps students write more structured and better even though there were no statistically significant changes between the experimental and control groups in their study. This kind of results was caused due to the small number of participants. As stated by Creswell (2020) the larger the sample size, the potential for error in the sample can be avoided. Large samples involved in research are more likely to be able to represent the conditions of the population.

The theory in line with the results of a research conducted by Rahmasari et al. (2024) who conducted research with a bigger sample size and involved half of the existing population, the theory is consistent with the findings of the research. The findings of the study demonstrate that the students' writing abilities improved after they participated in the therapy session utilizing Mindomo. The results of the post-test for the experimental group were superior to

those of the control group, with the experimental group receiving an average score of 80.31, which was better than the average score that the control class received, which was only 71.41. Moreover, the results of the questionnaire revealed that twenty-four out of thirty-two students are in agreement that using the Mindomo app is entertaining and has the potential to increase students' enthusiasm to write.

Another research from Al-Inbari et al. (2023) who have conducted research on two experimental classes using digital mind mapping and manual mind mapping, as well as a control class that does not use mind maps, also produced results that were not statistically significant between the two classes using digital mind maps and manual mind maps. The results between the two experimental classes were caused by the students' limited ability to use technology in digital mind mapping, and their unfamiliarity with mind mapping applications and the complexity of their use. This was also discussed by Hemeira, Nugraha, and Abas (2023) that the disadvantage of implementing Mindomo is that students who are not used to using technology in learning need more time to complete their assignments. In line with the results of research by Sagita, Yuliasri, Faridi, and Pratama (2024) that the use of technology in digital mind mapping requires a certain understanding of digital literacy. The potential benefits of digital mind maps cannot be maximized if students are not comfortable with their use.

Students' ability to learn using digital media can also be a reason that influences research results. Research from Mohamad, Luqman Asnawi, Abdul Kadir, and Darmi (2022) states that technology-based learning is more beneficial for students who are familiar with the use of technology than those who are not. Even though technology has been fundamental to English language instruction, its potential downsides should not be overlooked to maintain high-quality teaching and learning. Concerns have been raised regarding students' excessive screen time, the actual impact of teachers' technology integration, and inequities in technology access (Haleem, Javaid, Qadri, & Suman, 2022).

In contrast to the results by Abd Karim and Mustapha (2020), the use of digital mind mapping benefits students because of its effectiveness and flexibility of use which is more time-saving and makes it easier for students to design mind map forms in a wider space than manual mind mapping which helps them to write good texts. This is supported by research from Chalak and Rastgoo (2021) 16 out of 20 students prefer to use digital mind maps than manual mind maps because digital mind maps help in organizing writing and practicing their writing. In addition, learning using Mindomo received a positive response from students because it increased students' enthusiasm in the learning process (Novianti & Kareviati, 2021). Therefore, students' ability to learn using digital media has an influence on the research results.

Practically, these findings imply that before incorporating Mindomo into writing classes, teachers should offer preliminary direction and assistance with digital literacy. This preparation ensures that students concentrate on the writing abilities that the tool is intended to enhance rather than spending the majority of their learning time addressing technical difficulties. The results emphasize how crucial it is for schools to set up environments that increase the effectiveness of technology-supported learning, such as having enough devices, reliable internet connectivity, and brief instruction on digital tools. To enable teachers to confidently use digital mind mapping in the classroom, schools may also incorporate it into professional development programs. From a pedagogical perspective, the findings suggest that digital tools such as Mindomo should be introduced gradually and regularly so that students can become accustomed to them over time. Digital mind mapping has the ability to improve idea organization and writing processes more successfully with the right support and methodical use. Combining manual and digital mind mapping techniques could improve future teaching methods by allowing students to select the strategy that best suits their learning requirements.

## CONCLUSION

The goal of this study was to ascertain whether or not using Mindomo significantly affected high school students' ability to write critical exposition texts. In both courses, the results showed that the post-test scores were greater than the pre-test scores. The results of the hypothesis test demonstrated that neither the experimental class's nor the control class's post-test results satisfied the requirements for statistical significance. The p-value of 0.801 from the Mann Whitney U test, which was used to calculate the hypothesis test, makes it evident that there is no significant difference between the two groups. Given the circumstances of this investigation, these data suggest that the potential of Mindomo as a writing aid would not be sufficient to induce changes in writing skills that are statistically detectable. It is possible that the constraints of the study, such as the limited sample size and the brief duration of the treatment, were major contributors to the findings that were not statistically significant. Thus, some considerations need to be made for future research. It is recommended for future researchers to increase the number of samples that will be involved in the research process of using Mindomo in writing learning. In addition, an extension of the duration of the study can be done to see the effects and clearer developments of using Mindomo. This can also be a consideration for teachers who want to apply Mindomo in the learning process to see students' readiness in using technology in the classroom.

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