

## **The Application of Metacognition-Based Mind Mapping to Improve Junior High School Students' Expository Writing Skills**

**Nadia Apriyanti Felisa Barady**  
[nadiabarady7@gmail.com](mailto:nadiabarady7@gmail.com)

**Masayu Gay**  
[masayugey@isdikkieraha.ac.id](mailto:masayugey@isdikkieraha.ac.id)

**Idwan Djais**  
[idwanzais82@gmail.com](mailto:idwanzais82@gmail.com)

**Institut Sains dan Kependidikan Kie Raha Maluku Utara**

### **ABSTRACT**

This study aimed to improve the expository writing skills of eighth-grade students at SMP Negeri 7 Kota Ternate through the application of metacognition-based mind mapping. The study employed a classroom action research design conducted in two cycles, each consisting of planning, action, observation, and reflection. The participants were 37 students. Data were collected through a writing test, observation, and metacognitive reflection, and were analyzed quantitatively and qualitatively. The results showed an increase in the mean score from 43.25 in the pre-cycle to 59.46 in Cycle I and 78.38 in Cycle II, with mastery increasing from 43.25% to 59.46% and 78.38%, respectively. These findings indicate that metacognition-based mind mapping effectively helped students organize ideas and regulate the writing process. The contribution of this study lies in integrating idea mapping with metacognitive regulation as a learning strategy for expository writing.

**Key words:** Mind Mapping; Metacognition; Writing; Expository Text

### **INTRODUCTION**

Writing skills are an important ability in language learning because they enable students to develop and communicate ideas systematically (Harklau, 2002). Writing is not merely a matter of putting thoughts into written language; rather, it involves processes of planning, developing, organizing, monitoring, and revising ideas (Flower & Hayes, 1981; Limpo & Alves, 2018). In Indonesian language learning, these demands are evident in expository text writing, which requires students to convey ideas clearly, coherently, and logically. In practice, these skills have not yet developed optimally. Students still experience difficulties in generating and developing ideas, organizing content, and using vocabulary and language conventions appropriately. Similar conditions were found among eighth-grade students at SMP Negeri 7 Ternate City. The pre-cycle results showed an average writing skill score of 43.25, with 16 students (43.25%) achieving the mastery criterion, while 21 students (56.75%) had not yet achieved mastery. These

conditions indicate that students need support not only in developing ideas but also in regulating the writing process.

One strategy that can be employed is mind mapping, which helps students visualize and organize ideas before developing them into a text. Previous studies have shown that mind mapping can improve writing skills by facilitating the generation and organization of ideas (Laila et al., 2023; Wahid & Sudirman, 2023). However, idea mapping alone does not necessarily ensure that students can manage the writing process effectively. Students still need to determine what to write, monitor the development of their writing, and evaluate the resulting text. This need is closely related to metacognitive regulation. Flavell (1979) conceptualized metacognition as involving awareness and regulation of cognitive processes, which in this study is operationalized through planning, monitoring, and evaluating. Planning helps students establish goals and organize ideas, monitoring involves checking the progress and appropriateness of the writing, while evaluating involves assessing the outcome and determining necessary improvements. Qin et al. (2022) showed that these three components constitute important aspects of metacognitive strategies in writing and are associated with writing performance.

Although research on mind mapping and metacognition in writing has continued to develop, the two have largely been examined separately. Mind mapping has more often been used to support idea generation and organization, whereas metacognition focuses on regulating the writing process. This study positions mind mapping as a means of supporting metacognitive regulation, so that students not only map their ideas but also plan, monitor, and evaluate their writing processes. Based on this research gap, this study aims to improve the expository writing skills of eighth-grade students at SMP Negeri 7 Ternate City through the implementation of a metacognition-based mind mapping method.

## LITERATURE REVIEW

Writing is a cognitive and linguistic process that involves planning, idea development, text production, monitoring, and revision (Flower & Hayes, 1981). Therefore, writing skills are concerned not only with language use but also with the ability to organize ideas so that communicative goals can be achieved. Structured planning can also help writers organize ideas and improve the quality of their writing (Limpo & Alves, 2018). In this study, an expository text is understood as a text that presents ideas or information systematically, supported by relevant reasons and explanations. Therefore, writers need to determine the main idea, develop supporting ideas, and organize the content coherently. The teaching of expository writing should therefore address the processes of developing and organizing ideas in addition to the accurate use of language.

Mind mapping is a visual technique that can be used to map and organize ideas. In writing instruction, this technique serves as a prewriting strategy that helps students prepare and develop ideas before expressing them in a text (Mustika et al., 2025;

Sebit & Yildiz, 2020). Previous research has shown that mind mapping can help improve writing skills and organize ideas (Wahid & Sudirman, 2023). To make its use more effective, mind mapping can be integrated with metacognitive regulation through planning, monitoring, and evaluating. Metacognition, meanwhile, involves awareness and regulation of cognitive processes (Flavell, 1979). Schraw and Moshman (1995) distinguish between metacognitive knowledge and metacognitive regulation. This study focuses on regulation through planning, monitoring, and evaluating. Planning involves setting goals and selecting strategies, monitoring involves checking the ongoing process, while evaluating involves assessing the outcomes and the effectiveness of the strategies used.

Qin et al. (2022) showed that planning, monitoring, and evaluating are important components of metacognitive strategies in writing and are associated with writing performance. Similar findings among junior secondary school students indicate that writing planning, goal-oriented monitoring, and goal-oriented evaluation significantly predict writing performance (Teng et al., 2022). These findings suggest that metacognitive regulation is relevant to the development of writing skills among secondary school students. Huang and Zhang (2022) also showed that instruction that explicitly develops metacognitive strategies can influence how students regulate the writing process. Planning can become more goal-directed, while monitoring can develop from focusing primarily on linguistic aspects to regulating writing at the discourse level. Thus, metacognition involves not only awareness of the writing process but also the ability to regulate it (Escorcía & Gimenes, 2020).

Mind mapping and metacognition serve different but complementary functions. Mind mapping provides a visual representation for organizing ideas, whereas metacognition regulates its use throughout the writing process (Escorcía & Gimenes, 2020; Zhao & Liao, 2021). Thus, mind mapping can support planning, while monitoring and evaluating help students examine and improve the development and outcomes of their writing. This relationship can be understood as a sequence of mapping ideas, planning their development, monitoring the writing process, evaluating the outcome, and revising the text. This framework is consistent with the view of writing as a process involving iterative planning, text production, monitoring, and revision (Flower & Hayes, 1981; Hayes, 2012).

## **METHOD**

### **Design and Samples**

This study employed a classroom action research design Kemmis et al. (2014) conducted in two cycles to improve students' expository writing skills through a metacognition-based mind mapping approach. The study was conducted at SMP Negeri 7 Ternate City, Indonesia, and involved 37 eighth-grade students. Each cycle consisted of four stages: planning, action, observation, and reflection. Cycle I was conducted to implement the initial instructional strategy and identify aspects

requiring further improvement, whereas Cycle II was conducted by refining the instruction based on the results of the reflection from Cycle I.

### **Instruments and Procedures**

The research instruments consisted of an expository writing test, an observation sheet, and a metacognitive reflection sheet. The writing test was used to assess text structure, content and idea development, as well as language use. The observation sheet was used to observe students' activities during the implementation of the metacognition-based mind mapping approach, while the reflection sheet was used to identify students' Planning, Monitoring, and Evaluating processes based on the conceptualizations of metacognition proposed by (Flavell, 1979; Schraw & Moshman, 1995).

In practice, mind mapping was used as the primary strategy for organizing ideas during the prewriting stage. Students identified the topic and main idea, developed supporting ideas, and then visually mapped the relationships among ideas. These activities formed part of the Planning process. Subsequently, students used the idea map as a basis for developing their expository texts while Monitoring the appropriateness and development of their writing and Evaluating the resulting text and the aspects requiring improvement. The Planning indicators included goals, topic or main idea, supporting ideas, and organization of ideas; Monitoring included content appropriateness, idea development, errors, and relationships among ideas; whereas Evaluating included writing quality, adequacy of ideas, weaknesses, and areas for improvement.

The assessment of expository texts covered three aspects: structure (thesis, arguments, and reiteration); content (relevance, completeness, development, and organization of ideas); and language (word choice, sentence construction, spelling, and punctuation). The study was conducted in two cycles, each comprising planning, action, observation, and reflection. The results of the writing assessment, observations, and reflections from each cycle were used to refine the implementation of mind mapping and metacognitive strategies in the subsequent cycle.

### **Data Analysis**

Data were analyzed quantitatively and qualitatively. Quantitative analysis was used to determine students' writing skill scores, mean scores, and learning mastery at each stage of the study. The mean score was calculated by dividing the total score by the number of students, while learning mastery was determined based on the percentage of students who achieved the predetermined minimum mastery criterion. The results from the pre-cycle, Cycle I, and Cycle II were then compared to identify changes in students' writing skills. Qualitative analysis was used to describe changes in the instructional process and students' responses during the

implementation of the intervention through the stages of data condensation, data display, and conclusion drawing and verification (Miles et al., 2014).

Qualitative analysis was used to interpret students' learning activities and metacognitive processes during the intervention. Observation and reflection data were analyzed based on three metacognitive processes: planning, monitoring, and evaluating. The analysis focused on students' ability to organize ideas, monitor the development of their writing, identify problems, and evaluate and revise their texts. The quantitative and qualitative findings were then compared across cycles to explain changes in the instructional process and their relationship to improvements in students' writing skills.

## RESULTS AND DISCUSSION

### Initial Condition of Students' Expository Writing Skills

The pre-cycle results showed that the students' expository writing skills were still low. Of the 37 students, only 16 (43.25%) achieved the mastery criterion, while 21 students (56.75%) did not achieve mastery, with a class mean score of 43.25. These results indicate that most students had not yet been able to produce expository texts in accordance with the expected learning requirements. The difficulties were evident not only in the written products but also in the learning process. Students still experienced difficulties in understanding the elements of expository texts, generating and developing ideas, and using Indonesian vocabulary appropriately.

These conditions indicate that the students' main difficulties were not limited to their ability to produce sentences but also involved their ability to plan and organize ideas before writing. This finding provided the basis for implementing a metacognition-based mind mapping approach, as students needed not only a technique for generating ideas but also guidance in regulating their thinking processes throughout the writing process.

### Improvement in Writing Skills through Metacognition-Based Mind Mapping

The implementation of metacognition-based mind mapping resulted in a gradual improvement in students' writing skills. The development of students' scores and learning mastery is presented in Table 1.

*Table 1*  
*Development of Students' Expository Writing Skills*

| Stage     | Mean Score | Students Achieving Mastery | Mastery Percentage |
|-----------|------------|----------------------------|--------------------|
| Pre-cycle | 43.25      | 16                         | 43.25%             |

| Stage    | Mean Score | Students Achieving Mastery | Mastery Percentage |
|----------|------------|----------------------------|--------------------|
| Cycle I  | 59.46      | 22                         | 59.46%             |
| Cycle II | 78.38      | 28                         | 78.38%             |

*Source: Research data.*

Table 1 shows that the mean score increased by 16.21 points from the pre-cycle to Cycle I and by 18.92 points from Cycle I to Cycle II. Overall, the increase from the pre-cycle to Cycle II reached 35.13 points. The mastery percentage also increased from 43.25% to 59.46% in Cycle I and to 78.38% in Cycle II. In Cycle I, 22 students (59.46%) achieved mastery, while 15 students (40.54%) did not. In Cycle II, the number of students achieving mastery increased to 28 (78.38%), with 16 students (43.24%) falling into the very good category.

This improvement indicates that mind mapping helped students overcome difficulties in generating and organizing ideas. The visual mapping of ideas enabled students to identify the main topic and supporting ideas before developing them into a text. This finding is consistent with previous studies showing that mind mapping can help students develop and organize ideas in writing activities. Laila et al. (2023), for example, through a two-cycle classroom action research study, reported improvements in students' writing skills following the implementation of mind mapping. Similarly, Wahid and Sudirman (2023) reported a positive effect of the mind mapping technique on students' writing skills.

The greater improvement observed in Cycle II should be understood in relation to the refinement of the instructional intervention. At this stage, mind mapping was not simply reused but was integrated with metacognitive questions, discussions, revision examples, and prompts that encouraged students to engage in more independent monitoring and evaluation. Thus, the findings of this study extend previous research on mind mapping by demonstrating that idea mapping becomes more functional when embedded within an instructional process that explicitly develops metacognitive regulation.

### **Planning, Monitoring, and Evaluating in the Writing Process**

The improvement in students' writing skills occurred alongside the development of their metacognitive activities. The development of these activities is summarized in Table 2.

*Table 2*  
*Development of Metacognitive Processes in Writing Instruction*

| Aspect     | Cycle I                                                                                                                     | Cycle II                                                  | Development                                             |
|------------|-----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------------|
| Planning   | Identifying the topic, main idea, supporting ideas, and outline through mind mapping; some students still required guidance | Planning and idea development became more focused         | Planning became increasingly independent                |
| Monitoring | Checking the relevance of ideas, identifying errors, and revising the mind map                                              | More active monitoring of the writing process and content | Greater development of process regulation               |
| Evaluating | Rereading and revising the text, although spelling and punctuation errors were still found                                  | Evaluation and revision became more focused               | Reflection on the writing outcomes continued to develop |

*Source: Research observation and reflection data.*

In the planning aspect, students began to determine the purpose, topic, main idea, supporting ideas, and outline through mind mapping. Most students were able to develop a writing plan, although some still required teacher guidance to develop their ideas. This finding is consistent with Flavell's (1979), concept of metacognition, which views awareness and control of cognitive processes as important components of metacognition. In the context of writing, planning helps students determine the direction and strategies to be used before producing a text. Qin et al. (2022) also showed that planning, monitoring, and evaluating are important components of metacognitive strategies in writing and are associated with writing performance.

In the monitoring aspect, students began to check the relevance of their ideas to the topic, identify errors, engage in discussions to improve their writing, and revise their mind maps. Some students still required guidance and were not yet fully confident in expressing their opinions. These findings indicate that awareness of the need to monitor the writing process had emerged, but students' independence in applying this process was still developing. Within the framework proposed by Schraw and Moshman (1995), this condition can be understood as the development of metacognitive regulation, as students began to control their cognitive processes through checking and adjustment during writing activities.

Meanwhile, evaluating began to emerge when students reread their texts, identified errors, and made revisions. The spelling and punctuation errors that remained in Cycle I indicate that students' evaluative abilities had not yet fully developed. These reflections were subsequently used to refine the intervention in Cycle II. This pattern is consistent with Huang and Zhang (2022), who showed that the development of metacognitive strategies in writing does not necessarily progress evenly across all components. Thus, the improvement in students' writing skills in this study was not merely related to practicing text production but also to the development of their ability to regulate the writing process.

### **Integration of Mind Mapping and Metacognition in Improving Writing Skills**

When the outcomes and processes across the two cycles are considered together, it becomes evident that mind mapping and metacognition serve complementary functions. Mind mapping helps students visualize and organize their ideas, whereas metacognition guides students in planning, monitoring, and evaluating the use of those ideas in their writing. These findings are consistent with previous research on mind mapping, which has demonstrated the benefits of visual mapping for idea development and organization, as well as research on metacognition highlighting the importance of planning, monitoring, and evaluating in the writing process. Laila et al. (2023) showed that mind mapping can improve writing skills through instructional intervention, whereas Qin et al. (2022) demonstrated that metacognitive strategies are associated with writing performance. Pelenkahu et al. (2024) also showed that strategies integrating metacognition and critical thinking can be used to improve writing skills through classroom action research.

This study brings these two lines of research together within a single instructional process. Mind mapping provides a structure for organizing what students intend to write, whereas metacognition regulates how their writing is planned, monitored, and improved. This pattern was evident across the two cycles. In Cycle I, students began to use mind mapping and demonstrated metacognitive activities but still required guidance. In Cycle II, the reflection findings were used to strengthen planning, monitoring, and evaluating, enabling students to exercise greater control over the writing process.

Thus, the improvement observed in Cycle II cannot be understood solely as an effect of using mind mapping, but rather as the result of integrating idea mapping with metacognitive regulation. This finding represents an important contribution of the study, as it demonstrates that visual support and cognitive regulation can complement each other in the teaching of expository writing. Whereas previous studies have tended to position mind mapping as a strategy for organizing ideas and metacognition as a strategy for regulating the writing process, this study demonstrates how the two can be integrated within a single instructional sequence.



### **Learning Implications and Research Contributions**

The findings of this study indicate that the teaching of expository writing should pay attention to the process of producing texts, rather than focusing solely on the final product. Students need support not only to develop ideas but also to employ strategies for managing the process through which those ideas are developed into a text. In this context, mind mapping can be used to help students organize their ideas, while planning, monitoring, and evaluating can be used to develop students' awareness and control of the writing process. Teachers can guide students to begin with idea mapping and then provide metacognitive questions such as: What am I going to write? Are my ideas relevant to the topic? Are my ideas clearly organized? Which parts need to be improved?

The contribution of this study lies in integrating mind mapping with metacognitive regulation in the teaching of expository writing to junior secondary school students. This integration demonstrates that idea organization and process regulation are not two separate activities but can be incorporated into a single instructional sequence. Mind mapping functions as an external representation of ideas, while metacognition helps students regulate the use of those ideas throughout the writing process. Empirically, this contribution is reflected in the increase in the mean score from 43.25 in the pre-cycle to 59.46 in Cycle I and 78.38 in Cycle II, as well as in the increase in learning mastery from 43.25% to 59.46% and 78.38%, respectively. The results of Cycle II provided the basis for terminating the intervention because the predetermined success criterion had been achieved. Overall, this study demonstrates that the implementation of metacognition-based mind mapping can support students' development of expository writing skills through three interrelated processes: organizing ideas, regulating the writing process, and evaluating the resulting text. Thus, instructional success is demonstrated not only by improvements in writing scores but also by changes in the way students regulate their thinking processes during writing.

### **CONCLUSION**

The implementation of the metacognition-based mind mapping method improved the expository writing skills of eighth-grade students at SMP Negeri 7 Ternate City. The improvement occurred progressively, with the mean score increasing from 43.25 in the pre-cycle to 59.46 in Cycle I and 78.38 in Cycle II. The percentage of students achieving mastery also increased from 43.25% in the pre-cycle to 59.46% in Cycle I and 78.38% in Cycle II. The improvement was evident not only in the students' written products but also in the learning process. Mind mapping helped students organize and develop their ideas, while metacognitive regulation through planning, monitoring, and evaluating helped students plan, monitor, and evaluate their writing processes. The strengthening of these three processes in Cycle II coincided with greater learning gains compared with Cycle I. Thus, this study demonstrates that integrating mind mapping and metacognitive regulation can be an effective approach to supporting students' development of expository writing

skills. The contribution of this study lies in integrating idea mapping with metacognitive regulation so that instruction focuses not only on the written product but also on students' processes of planning, developing, monitoring, and revising their writing.

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