Jurnal Inovasi Penelitian Ilmu Pendidikan Indonesia
Volume 4, Nomor 3, Tahun 2025, Halaman 1821 – 1827
https://jipipi.org/index.php/jipipi

E-ISSN : 3063 - 1114
P-ISSN : 3063 - 1076

The Impact of Metacognitive Strategies on Students' Expository Reading Comprehension Achievement

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Abstract

This study aimed to examine the effect of applying metacognitive strategies on the expository reading comprehension achievement of vocational high school students. The research utilized a quasi-experimental design with a pre-test-post-test control group model, involving 32 eleventh-grade students at SMKS Muhammadiyah Jember. The experimental group (n=16) received an intervention consisting of metacognitive strategy instruction facilitated by a reflection table, while the control group (n=16) followed conventional instruction. Data were collected through reading comprehension tests and analyzed using the Wilcoxon Signed-Rank Test due to the non-normal distribution of the control group's post-test data. The findings revealed a statistically significant improvement in the experimental group from pre-test to post-test (p=0.002), whereas no significant change was observed in the control group (p=0.101). It is concluded that metacognitive strategies, particularly when implemented with a structured reflection tool, are a highly effective intervention for improving expository text comprehension in the vocational education context.

Keywords: *Metacognitive Strategies, Reading Comprehension, Expository Text, Vocational Students*

INTRODUCTION

Reading comprehension is a fundamental skill in English language learning, serving as a cornerstone for academic success and lifelong learning. It enables students to process, analyze, and interpret written information effectively, which is critical for their cognitive and intellectual development. According to Muhid et al. (2020), reading is not merely about decoding text but involves a deep understanding of the information presented. This skill is particularly vital in the context of expository texts, which are prevalent in academic and professional settings due to their informative and structured nature. However, despite its importance, many students struggle with reading comprehension, especially when dealing with complex expository materials.

The challenges students face in reading comprehension are multifaceted. Research by Pasaribu et al. (2021) highlights that a lack of effective reading strategies often leads to poor comprehension and low academic achievement. Students frequently skim texts without engaging critically with the content, resulting in superficial understanding and an inability to extract key ideas or synthesize information. This issue is exacerbated by the conventional teaching methods that dominate many classrooms, which tend to focus on rote memorization and passive reading rather than fostering active engagement with texts. As noted by Anthonysamy et al. (2020), such methods fail to equip students with the tools they need to navigate challenging texts independently.

Previous research has explored various strategies to improve reading comprehension, with metacognitive approaches showing significant promise. Khoiri (2012) conducted a study on eleventh-grade students in Indonesia, demonstrating that metacognitive strategies significantly enhanced reading comprehension compared to traditional methods. Similarly, Tavakoli (2014) investigated the effectiveness of metacognitive strategy awareness among university EFL learners in Iran, finding a strong positive correlation between metacognitive awareness and reading comprehension achievement. However, Tavakoli's study also identified limitations, such

E-ISSN : 3063 - 1114
P-ISSN : 3063 - 1076

as the lack of structured reflection tools to measure metacognitive awareness systematically. These gaps highlight the need for further research, particularly in vocational education contexts and with a focus on expository texts.

In response to these challenges, metacognitive strategies have emerged as a powerful approach to enhance reading comprehension. Metacognition, defined as "thinking about one's own thinking," involves planning, monitoring, and evaluating one's cognitive processes during learning (Flavell, cited in Huang et al., 2021). By applying metacognitive strategies, students become more aware of their reading processes, enabling them to identify misunderstandings, adjust their approaches, and deepen their comprehension. For instance, Zhang & Peterson (2023) emphasize that metacognitive techniques such as self-questioning ("What is the author's main point?") and summarizing help students actively engage with texts and retain information more effectively.

The significance of metacognitive strategies is further underscored by their alignment with the demands of expository texts. Expository texts, characterized by their clear structure (thesis, arguments, conclusion) and factual content, require readers to organize and interpret information systematically. As Collins et al. (2021) argue, these texts are particularly suited to metacognitive approaches because they necessitate strategic planning (e.g., previewing headings), ongoing monitoring (e.g., checking for understanding), and post-reading evaluation (e.g., reflecting on key takeaways). Despite this potential, previous research by Khoiri (2012) and Tavakoli (2014) has primarily focused on general reading comprehension, leaving gaps in understanding how metacognitive strategies specifically impact expository text comprehension, particularly among vocational high school (SMK) students.

This study aims to address these gaps by investigating the effect of metacognitive strategies on students' expository reading comprehension achievement. Unlike prior studies, this research introduces a structured reflection table (Table 3.3) to systematically guide students' metacognitive processes, filling a methodological void identified in earlier works. Additionally, it narrows its focus to vocational students—a demographic often overlooked in metacognition research—thereby contributing to a more nuanced understanding of how these strategies can be tailored to diverse educational contexts. The findings are expected to offer practical insights for educators seeking to enhance reading instruction and theoretical contributions to the broader discourse on metacognition and literacy.

In summary, this study is grounded in the premise that metacognitive strategies can transform students' reading comprehension abilities by fostering self-regulated learning. By examining their impact on expository texts within a vocational education setting, the research seeks to validate their efficacy and provide actionable recommendations for classroom implementation. As Schraw & Dennison (2021) assert, metacognition is not just a skill but a catalyst for academic empowerment, enabling students to navigate complex texts with confidence and critical awareness.

RESEARCH METHOD

2.1. Research Design

This research uses a quantitative approach with a quasi-experimental design. This design was chosen because the researcher does not have full control to conduct random assignment of students to different groups, a common constraint in real school environments.

Specifically, the design used is the Pre-test-Post-test Control Group Design. This design involves two groups: an experimental group that receives the treatment and a control group that does not. By comparing reading comprehension scores before (pre-test) and after (post-test) the intervention, this design allows the researcher to measure the impact of the treatment provided. The structure of this research design is summarized in Table 1.

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Table 1. Quasi-Experimental Research Design

No	Group	Pre-test	Treatment	Post-test
1	Experimental Group	X_1	Metacognitive Strategy	X_2
2	Control Group	Y_1	Conventional Method	Y_2

2.2. Participants

The population of this study was all students at SMKS Muhammadiyah Jember, totaling 55 students. The research sample consisted of 32 eleventh-grade students from two intact classes (XI-A and XI-B). Initially, the sample size was 38 students, but 6 students were excluded due to low attendance to ensure that the collected data came from participants who consistently followed the entire research series.

The sampling technique used was purposive sampling. One class was designated as the experimental group and the other as the control group. This determination was based on the recommendation of the English teacher at the school, who stated that both classes had comparable initial abilities. This selection, although not random, helps to strengthen the validity of the comparison between the two groups.

2.3. Instruments and Materials

Reading Comprehension Test The main instrument used to collect data was a multiple-choice reading comprehension test consisting of 20 items. This test was specifically designed to measure students' ability to understand expository texts. The scoring system used was to award 5 points for each correct answer and 0 points for each incorrect answer, so the maximum possible score was 100.

Validity and Reliability of the Instrument The quality of the instrument was ensured through rigorous validity and reliability testing.

- **Validity:** Content validity was ensured by aligning the test items with the applicable curriculum. Item validity was tested using the Pearson Product-Moment correlation on an initial 40 items. As a result, 29 items were declared valid and selected for use in the final test.
- **Reliability:** The internal consistency of the 29 valid items was measured using Cronbach's Alpha. The analysis showed an Alpha value of **0.954**, which indicates an excellent level of reliability for the instrument.

Learning Materials The materials used in the learning and testing process included several expository texts, such as texts titled "Photosynthesis" and "TikTok". The core component of the treatment for the experimental group was the use of a **Metacognitive Reflection Table**. This table, adapted from the research, contained a series of guiding questions such as "What makes this task difficult for me?" and "How can I improve my skills next time?". This table served as a scaffold to help students actively plan, monitor, and evaluate their reading process.

2.4. Procedure

This research was conducted over three weeks with a systematic and structured procedure. The steps of the research procedure are as follows:

1. **Week 1: Initial Assessment.** Both groups, experimental and control, were given a pre-test to measure their initial reading comprehension level before the intervention was administered.
2. **Week 2: Treatment Phase.** During this phase, the two groups received different teaching methods.
    - **Experimental Group:** Students were taught metacognitive strategies (planning, monitoring, and evaluation). The teacher explicitly modeled the use of the **Metacognitive Reflection Table** to guide the process of reading expository texts.

E-ISSN : 3063 - 1114
P-ISSN : 3063 - 1076

Students then practiced applying this strategy independently with the help of the table.

- **Control Group:** Students received instruction using the conventional method, which centered on direct feedback and the lecture method from the teacher, without special emphasis on metacognitive strategies.

3. **Week 3: Post-Intervention Assessment.** Both groups were given a post-test identical to the pre-test. This test aimed to measure changes or improvements in reading comprehension after the treatment period.

2.5. Data Analysis

All collected quantitative data were analyzed using SPSS version 21 software. The data analysis procedure involved two main steps.

First, the **Shapiro-Wilk normality test** was conducted to check whether the pre-test and post-test score data from both groups were normally distributed. The test results showed that the pre-test and post-test data for the experimental group, as well as the pre-test data for the control group, were normally distributed ($p>0.05$). However, the post-test data for the control group were found **not to be normally distributed** ($p=0.038$). This violation of the normality assumption required the use of a non-parametric statistical test.

Second, due to the violation of the normality assumption, the analysis to compare pre-test and post-test scores within each group was performed using the **Wilcoxon Signed-Rank Test**. This test is an appropriate non-parametric alternative to the paired-samples t-test. The choice of this statistical test demonstrates a careful response to the actual characteristics of the data, rather than a rigid application of standard procedures. This decision fundamentally increases confidence in the validity of the research findings, as it prevents potential Type I errors (finding a significant result that does not actually exist) that could occur if a parametric test were forced on data that does not meet its assumptions. The combination of a highly reliable instrument (Cronbach's $\alpha = 0.954$) with a robust and appropriate statistical test creates a solid methodological foundation for the research conclusions.

RESULTS AND DISCUSSION

3.1. Descriptive Analysis

A descriptive statistical analysis was conducted to provide a general overview of the students' reading comprehension scores before and after the intervention. The mean and standard deviation data for the experimental and control groups are presented in Table 2.

Table 2. Descriptive Statistics of Pre-test and Post-test Scores

Group	Test	N	Mean	Standard Deviation (SD)
Experimental	Pre-test	16	58.13	10.83
	Post-test	16	73.44	11.95
Control	Pre-test	16	45.31	8.84
	Post-test	16	48.44	8.63

The data in Table 2 show a substantial increase in the average score for the experimental group, from 58.13 on the pre-test to 73.44 on the post-test, an increase of 15.31 points. In contrast, the control group showed only a minimal increase from 45.31 to 48.44, a difference of 3.13 points. This initial finding indicates that the metacognitive strategy intervention had a greater impact than the conventional teaching method.

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3.2. Inferential Analysis

To test the statistical significance of the score changes, the *Wilcoxon Signed-Rank Test* was used because the post-test data for the control group were not normally distributed (p=0.038). The results of the inferential analysis are presented in Table 3.

Table 3. Results of Wilcoxon Signed-Rank Test for Within-Group Comparison

Group	Comparison	Z-Value	Asymp. Sig. (2-tailed)	Decision
Experimental	Post-test vs. Pre-test	-3.076	0.002	Significant Difference
Control	Post-test vs. Pre-test	-1.638	0.101	No Significant Difference

The test results for the **experimental group** show a significance value of p=0.002, which is below the α=0.05 threshold. This indicates a statistically significant increase in students' reading comprehension achievement after the implementation of the metacognitive strategy. The rank analysis supports this finding, with 12 out of 16 students showing an increase in scores (positive ranks).

For the **control group**, the obtained significance value is p=0.101, which is greater than α=0.05. Therefore, it is concluded that there was no statistically significant difference between the pre-test and post-test scores in the group that followed conventional instruction.

3.3. Hypothesis Testing

Based on the inferential analysis:

- The **Alternative Hypothesis (Ha)**, which states that there is a significant effect of implementing metacognitive strategies on reading comprehension achievement, is **accepted** for the experimental group (p<0.05).
- The **Null Hypothesis (Ho)**, which states there is no significant effect, is **accepted** for the control group (p>0.05).

This finding quantitatively confirms that the metacognitive strategy intervention had a significant effect, whereas the conventional method did not produce a significant change within the research period.

4. Discussion

4.1. Interpretation of Findings: The Crucial Role of a Structured Reflection Tool

The significant increase in the experimental group can be attributed to the core mechanism of the intervention: the practice of self-regulation facilitated by the Metacognitive Reflection Table. This tool served as a cognitive scaffold that transformed metacognitive strategies from abstract concepts into a series of concrete actions. The guiding questions in the table explicitly prompted students to engage in the cycle of planning, monitoring, and evaluation—fundamental components of cognitive regulation. This process forced students to actively interact with the text and their own thought processes, a fundamentally different approach from passive learning. The success of this intervention underscores that it is not merely knowledge of strategies that is important, but the active and guided practice of regulating those strategies.

4.2. Contextualization in Scientific Literature

The results of this study are consistent with the majority of literature showing a positive relationship between metacognitive strategies and reading comprehension. This finding reinforces previous studies by Khoiri (2012) and Tavakoli (2014), which also reported positive impacts from metacognitive interventions.

However, the finding becomes more nuanced when compared to some studies that have reported weak or insignificant relationships. The existence of contradictory results in the literature indicates that the success of metacognitive strategies is highly dependent on the

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method of implementation. The significant success in this study, compared to less conclusive results elsewhere, can be explained by the use of a structured tool (the reflection table). This tool ensured that students were not only told about the strategies but consistently practiced them. This suggests that explicit, structured, and repeated interventions are more likely to yield measurable impacts.

Furthermore, the research focus on expository texts—which have a logical and information-dense structure—is highly relevant, as different text types may require different strategic approaches.

4.3. Pedagogical Implications

This finding offers significant practical implications for educators, especially in vocational education settings. Teachers can substantially improve students' reading comprehension by integrating simple, structured metacognitive tools into their instruction. The reflection table is a practical intervention model that does not require extensive resources and can be adapted for various texts and subjects.

For vocational students, developing metacognitive skills not only improves current academic performance but also equips them with the "learning how to learn" competency, which is essential for success in a workforce that demands continuous learning and adaptation.

4.4. Limitations and Future Research Directions

This study has several limitations. The relatively small sample size (N=32) and its implementation in a single school limit the generalizability of the results. The short duration of the intervention (three weeks) may not be sufficient to measure long-term effects, and the quasi-experimental design without random assignment limits strong causal claims.

These limitations open several avenues for future research:

1. **Longitudinal Studies:** To investigate whether the positive effects of the intervention are sustained over time and become autonomous learning habits.
2. **Large-Scale Replication:** To replicate the study with a larger, more diverse sample from various vocational schools to enhance external validity.
3. **Qualitative Investigation:** To incorporate qualitative methods to gain a deeper understanding of students' thought processes. The use of *think-aloud protocols*, where students verbalize their thoughts while reading, could provide rich data on how students experience and utilize the intervention, complementing the quantitative findings.

CONCLUSION

Based on the results of the data analysis and discussion, it can be concluded that the application of metacognitive strategies, facilitated by a structured reflection tool, has a statistically significant positive effect on the expository reading comprehension achievement of students at SMKS Muhammadiyah Jember. The experimental group showed a significant improvement ($p=0.002$), while the control group, which used conventional methods, did not show a significant change ($p=0.101$).

The success of this intervention lies in the use of the reflection table, which effectively transformed the concepts of metacognition (planning, monitoring, and evaluation) into concrete and guided actions. This tool empowered students to actively regulate their learning process, leading to a deeper and more analytical understanding of the text.

This finding provides strong empirical evidence that metacognitive strategies, when implemented with appropriate support tools, are a highly effective pedagogical intervention. Therefore, the integration of structured metacognitive tools into teaching practices is highly recommended as a high-impact strategy to equip vocational students with fundamental competencies for lifelong learning and future career success.

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P-ISSN : 3063 - 1076

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