



## Comprehension Strategies as Cognitive Predictors of Multiteks Understanding: Evidence from a Mixed-Methods Study in Elementary Schools

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### Abstract

The increasing use of written, audio, and audiovisual texts in 21st-century learning requires elementary students to employ effective comprehension strategies for processing multimodal information. This study examined students' multiteks comprehension across different text modes and explored the potential predictive role of planning, monitoring, and evaluation strategies. An explanatory sequential mixed-methods design was employed involving 56 fifth-grade students from an elementary school in Palembang, Indonesia. Quantitative data were collected using a comprehension strategy questionnaire and a multiteks comprehension test, while qualitative data were obtained through open-ended questionnaires. Quantitative data were analyzed using descriptive statistics and Pearson correlation, whereas qualitative data were analyzed thematically. The results showed that students experienced the greatest difficulty with written texts (58.93% at the low level), while comprehension was higher for audio (82.1%) and audiovisual (89.3%) texts. Planning strategies showed significant positive correlations with comprehension across all text modes, whereas monitoring and evaluation strategies were associated with specific text modes. Qualitative findings indicated that high-achieving students applied comprehension strategies more systematically and metacognitively than low- and medium-achieving students. These findings suggest that comprehension strategies, particularly planning, may play an important role in supporting students' multiteks understanding and should be explicitly integrated into elementary classroom instruction.

**Keywords:** Comprehension Strategies, Cognitive Predictors, Multiteks Understanding, Mixed-Methods Study

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## INTRODUCTION

The rapid expansion of multimodal information in the digital era has transformed the nature of literacy, requiring learners to engage with texts presented in diverse formats, including written, audio, and audiovisual modes (Akinsemolu & Onyeaka, 2025; Balakrishnan et al., 2022). This shift has given rise to the concept of multiteks, which refers to the integration of multiple text forms within a single learning context (Kusumaningrum et al., 2024; Masinde et al., 2023). In elementary education, the ability to comprehend multiteks is increasingly recognized as a fundamental component of 21st-century literacy (Damayanti



& Farihah, 2023; Kasperski et al., 2022). However, this complexity also introduces cognitive challenges, particularly for younger learners who are still developing foundational comprehension skills.

From a cognitive perspective, understanding multiteks requires not only basic decoding and interpretation but also higher-order processes such as integration, inference, and regulation of comprehension across modalities (Cromley et al., 2021). These processes are closely associated with metacognitive regulation, which includes planning, monitoring, and evaluation strategies (Abdulkadir, 2025; Ghimire & Mokhtari, 2025; Siswanto et al., 2023). Planning involves setting goals and activating prior knowledge before engaging with a text; monitoring refers to the ongoing awareness and control of comprehension during reading or listening; and evaluation entails reflecting on and assessing comprehension outcomes after engagement (Arifianti et al., 2025; Kholis & Azmi, 2023). Together, these strategies function as cognitive mechanisms that enable learners to manage and optimize their understanding processes.

Previous studies have demonstrated that comprehension strategies play a significant role in enhancing reading comprehension and learning outcomes. However, much of the existing literature has focused predominantly on single-mode texts, particularly written texts, with limited attention to multimodal or multitek contexts (Law, 2024; Sajja et al., 2024). Moreover, while some studies have examined the relationship between metacognitive strategies and comprehension, few have explicitly investigated how these strategies function as cognitive predictors across different text modes (Fadholi, 2025; McCrudden et al., 2022; Schmidt & Strassner, 2022). This gap is particularly relevant in elementary education, where students often exhibit uneven comprehension depending on the text's modality.

Empirical observations suggest that students perform differently when engaging with written, audio, and audiovisual texts, suggesting that each modality may require distinct cognitive processing strategies. Despite this variability, instructional practices in elementary schools often do not explicitly integrate strategy-based approaches tailored to multitek learning. As a result, many students struggle to apply appropriate comprehension strategies effectively, leading to inconsistent learning outcomes.

Addressing this gap, the present study investigates comprehension strategies as cognitive predictors of multiteks understanding among fifth-grade elementary students. Specifically, this study aims to (1) examine students' comprehension abilities across different text modes and (2) analyze the extent to which planning, monitoring, and evaluation strategies predict multiteks understanding. By employing a mixed-methods approach, this study not only quantifies the relationships between variables but also explores how students apply these strategies in practice. This study contributes to the growing body of research on cognitive and metacognitive processes in literacy by extending the analysis to multitek contexts. It offers empirical evidence on how comprehension strategies function across different modalities and highlights the importance of integrating explicit strategy instruction in elementary education. Furthermore, the findings provide insights into the cognitive mechanisms underlying students' engagement with multiteks, thereby supporting the development of more effective, multimodal learning practices.

## **RESEARCH METHOD**

This study employed a mixed-methods approach using an explanatory sequential design (Mulisa, 2022). In this design, quantitative data were collected and analyzed in the first phase, followed by qualitative data collection to explain and elaborate on the quantitative findings. This approach was selected to provide a comprehensive understanding of the relationships between comprehension strategies and multiteks understanding among elementary school students.

### ***Participants***

The participants consisted of 56 fifth-grade students from a public elementary school in Palembang, Indonesia. A total sampling technique was applied, in which all students in the population were included as research participants. For the qualitative phase, a purposive sampling technique was used to select students representing three achievement levels (low, medium, and high) based on their comprehension test results. This categorization aimed to capture variations in the use of comprehension strategies across different performance levels.

### ***Instruments***

Data were collected using both quantitative and qualitative instruments (Younas et al., 2023). A Comprehension Strategy Questionnaire was administered to measure students' use of comprehension strategies, including planning, monitoring, and evaluation. The questionnaire employed a five-point Likert scale and was developed based on established metacognitive frameworks, with adaptations to suit the characteristics and cognitive development of elementary school students.

Students' comprehension ability was assessed using a Multiteks Comprehension Test consisting of multiple item formats, including essay questions, multiple-choice items, and true-false statements. The test covered three text modalities—written, audio, and audiovisual—to evaluate students' comprehension across different forms of information presentation. To obtain more in-depth insights into students' learning experiences, an Open-Ended Questionnaire was administered to selected participants during the qualitative phase of the study. This instrument explored students' perceptions of the comprehension strategies they employed, the challenges they encountered, and their experiences in understanding multiteks.

All research instruments underwent validity and reliability testing before implementation. The quantitative instruments were examined using appropriate statistical procedures to establish construct validity and internal consistency. In contrast, content validity was evaluated through expert judgment involving specialists in language education and experienced elementary school teachers to ensure that the instruments were appropriate for the target population.

### ***Data Collection Procedures***

Data collection was conducted in two sequential phases. In the first phase, quantitative data were gathered through the administration of the comprehension strategy questionnaire and the Multiteks comprehension test. In the second phase, qualitative data were collected through open-ended questionnaires administered to selected students based on their achievement levels. This sequential process allowed for the integration of quantitative results with qualitative explanations.

### ***Data Analysis***

Quantitative data were analyzed using descriptive statistics to determine the distribution of students' comprehension abilities and strategy use. A normality test was conducted to ensure the suitability of parametric analysis. Pearson correlation analysis was then employed to examine the relationships between comprehension strategies (planning, monitoring, and evaluation) and multiteks comprehension across different text modes (Hirose & Creswell, 2023). Qualitative data were analyzed using thematic analysis. Responses from the open-ended questionnaires were coded, categorized, and analyzed to identify patterns in students' use of comprehension strategies. The qualitative findings were used to support and explain the quantitative results, particularly in understanding differences in strategy use among students with varying levels of achievement.

### ***Ethical Considerations***

Ethical approval for this study was obtained from the relevant institutional authority. Participation was voluntary, and informed consent was obtained from students and their guardians. All data were treated confidentially, and participants' identities were anonymized to ensure privacy and ethical compliance.

## **FINDINGS AND DISCUSSION**

### **Quantitative Results**

#### ***Students' Multiteks Comprehension Across Text Modes***

Students' comprehension levels varied across the three text modes (written, audio, and audiovisual), as presented in Table 1.

**Table 1. Distribution of Students' Multiteks Comprehension Levels (N = 56)**

<b>Text Mode</b>	<b>Low (%)</b>	<b>Medium (%)</b>	<b>High (%)</b>
Written	58.93	30.36	10.71
Audio	17.90	46.43	35.67
Audiovisual	10.70	44.60	44.60

The results indicate that students experienced the greatest difficulty in comprehending written texts, with more than half (58.93%) classified as having a low level of comprehension. In contrast, most students achieved medium to high levels of comprehension in audio and audiovisual texts. These findings suggest that students demonstrated better comprehension when information was presented through audio or audiovisual formats than through written texts alone.

#### ***Descriptive Statistics of Comprehension Strategies***

The descriptive statistics for students' use of comprehension strategies are presented in Table 2.

**Table 2. Descriptive Statistics of Comprehension Strategies (N = 56)**

<b>Strategy</b>	<b>Mean</b>	<b>SD</b>	<b>Category</b>
Planning	3.72	0.54	High
Monitoring	3.45	0.61	Moderate
Evaluation	3.38	0.58	Moderate

Planning strategies obtained the highest mean score ( $M = 3.72$ ,  $SD = 0.54$ ), indicating that students tended to prepare before engaging with multiteks. In contrast, monitoring and evaluation strategies were used less frequently, suggesting that students were less consistent in regulating and reflecting on their comprehension processes.

#### ***Correlation between Comprehension Strategies and Multiteks Comprehension***

Pearson correlation analysis was conducted to examine the relationships between comprehension strategies and students' multiteks comprehension across written, audio, and audiovisual text modes. The results are presented in Table 3.

**Table 3. Pearson Correlation (N = 56)**

<b>Strategy</b>	<b>Written (r)</b>	<b>Audio (r)</b>	<b>Audiovisual (r)</b>
Planning	0.412*	0.539**	0.467**
Monitoring	0.182 (ns)	0.544**	0.374*
Evaluation	0.535**	0.095 (ns)	0.298*

*Note.*  $p < .05$ ,  $p < .01$ , ns = not significant.

The results indicate that planning strategies showed significant positive correlations with comprehension across all text modes, with the strongest relationship observed in audio texts ( $r = .539$ ,  $p < .01$ ). Monitoring strategies were significantly correlated with comprehension in audio and audiovisual texts but showed no significant relationship with written text comprehension. Similarly, evaluation strategies were significantly correlated with comprehension in written and audiovisual texts but not with audio text comprehension. These findings suggest that the relationships between comprehension strategies and multiteks comprehension vary according to text modality.

### **Qualitative Findings**

The qualitative findings were analyzed to explain the quantitative results regarding students' use of comprehension strategies in understanding multiteks. Responses from students representing high-, medium-, and low-achievement groups were coded and categorized using thematic analysis. Three major themes emerged from the data: structured and metacognitive strategy use, partial and inconsistent strategy use, and limited and reactive strategy use. These themes reflected differences in the ways students planned, monitored, and evaluated their comprehension when interacting with written, audio, and audiovisual texts. The qualitative findings provide a deeper understanding of why students demonstrated different levels of multiteks comprehension across text modalities.

#### ***Structured and Metacognitive Strategy Use***

Students in the high-achievement group consistently demonstrated structured and purposeful use of comprehension strategies. Before reading, listening, or watching a text, they reported identifying the topic, recalling relevant prior knowledge, and setting learning goals. During the comprehension process, they actively monitored their understanding by rereading passages, replaying audio recordings, or paying closer attention to important visual information when necessary. They also evaluated their comprehension by reviewing their answers and comparing them with the information presented in the texts. These students described comprehension as an active process that required continuous self-monitoring and reflection. As one participant explained, *"Before I start reading or listening, I try to predict what the text is about. If I do not understand something, I read or listen again until I understand it"* (P1, High Achievement).

#### ***Partial and Inconsistent Strategy Use***

Students in the medium-achievement group demonstrated awareness of comprehension strategies but applied them inconsistently. Planning activities were generally limited to reading the title or observing illustrations before beginning the task. Monitoring was usually carried out only after students encountered unfamiliar words or confusing information rather than throughout the comprehension process. Similarly, evaluation was conducted only when students doubted the accuracy of their answers or when prompted by the teacher. As a result, their strategy use was largely reactive instead of systematic. One participant stated, *"I check my answers only if I think they might be wrong. Usually, I just continue reading without stopping"* (P8, Medium Achievement).

#### ***Limited and Reactive Strategy Use***

Students in the low-achievement group exhibited limited use of comprehension strategies throughout the learning process. Most participants reported reading, listening, or watching texts without establishing clear objectives or activating prior knowledge. When they experienced comprehension difficulties, they tended to skip unfamiliar information or wait for assistance from teachers or classmates instead of attempting to resolve the problem

independently. Reflection after completing the task was also minimal because students generally believed that completing the activity was sufficient. This pattern indicates a lack of metacognitive awareness during comprehension. As one participant commented, *“If I do not understand the text, I usually wait for the teacher to explain it because I do not know what I should do”* (P15, Low Achievement).

### **Comparison Across Achievement Groups**

Comparison across the three achievement groups revealed clear differences in the quality and consistency of strategy use. High-achieving students integrated planning, monitoring, and evaluation throughout the comprehension process, whereas medium-achieving students applied these strategies selectively and inconsistently. In contrast, low-achieving students demonstrated limited strategic behavior and relied primarily on external support to understand the texts. These differences were evident across written, audio, and audiovisual texts, although students generally reported greater confidence when working with audio and audiovisual materials. This finding is consistent with the quantitative results, which showed higher levels of comprehension in audio and audiovisual texts than in written texts.

The qualitative findings complement the quantitative results by illustrating how differences in comprehension strategy use are reflected in students' multiteks understanding. Students who consistently planned, monitored, and evaluated their comprehension demonstrated stronger performance across text modalities, whereas inconsistent or limited strategy use was associated with lower levels of comprehension. The findings also provide an explanation for the significant correlations identified in the quantitative analysis, particularly the consistent relationship between planning strategies and multiteks comprehension. Together, these results suggest that effective multiteks comprehension depends not only on students' access to multiple forms of text but also on their ability to apply comprehension strategies in a systematic and metacognitive manner across different learning contexts.

### **Integration of Quantitative and Qualitative Findings**

The integration of the quantitative and qualitative findings demonstrates a clear convergence between the two phases of the study. The quantitative results showed that students' multiteks comprehension differed across written, audio, and audiovisual text modes and that comprehension strategies were significantly associated with students' performance. The qualitative findings provided contextual explanations for these statistical relationships by illustrating how students actually applied planning, monitoring, and evaluation strategies during comprehension activities. Taken together, the findings offer a more comprehensive understanding of the role of comprehension strategies in supporting multiteks understanding. This integration highlights the complementary nature of the explanatory sequential mixed-methods design.

The strongest convergence was observed in relation to planning strategies. Quantitative analysis revealed that planning showed significant positive correlations with comprehension across all text modes and demonstrated the strongest relationship with audio texts. This finding was reinforced by qualitative evidence indicating that high-achieving students consistently planned their learning before engaging with written, audio, and audiovisual materials. They reported activating prior knowledge, predicting text content, and establishing learning goals before beginning comprehension tasks. These systematic behaviors suggest that planning serves as a fundamental strategy that supports students' understanding regardless of text modality.

The integration of findings also explains the varying relationships observed for monitoring and evaluation strategies. Quantitatively, monitoring was significantly associated with comprehension in audio and audiovisual texts but not in written texts, whereas

evaluation showed significant relationships with written and audiovisual texts only. The qualitative data indicate that these strategies were generally applied inconsistently, particularly by students in the medium- and low-achievement groups. Most students reported monitoring their comprehension or evaluating their performance only after encountering difficulties or when prompted by teachers. These findings suggest that the effectiveness of monitoring and evaluation depends not only on the type of text but also on students' ability to apply these strategies consistently throughout the comprehension process.

Another important point of convergence concerns differences among achievement groups. High-achieving students demonstrated purposeful and metacognitive use of comprehension strategies, whereas medium-achieving students employed them selectively and low-achieving students relied primarily on external assistance. These qualitative patterns correspond closely with the quantitative findings showing stronger comprehension among students who reported higher use of planning and other comprehension strategies. The consistency between the two datasets strengthens the credibility of the findings by demonstrating that statistical relationships are reflected in students' actual learning experiences. Consequently, the qualitative evidence provides meaningful explanations for the quantitative patterns observed in the study.

The integration of quantitative and qualitative findings suggests that comprehension strategies play an important role in supporting students' multiteks understanding across different text modalities. Although students generally performed better on audio and audiovisual texts than on written texts, the qualitative evidence indicates that successful comprehension depends largely on the systematic application of planning, monitoring, and evaluation strategies. The convergence of findings demonstrates that strategic comprehension is closely related to students' ability to process multimodal information effectively. These results underscore the importance of explicitly teaching comprehension strategies in elementary classrooms to help students develop stronger multiteks comprehension skills in increasingly multimodal learning environments.

## **Discussion**

This study examined comprehension strategies as cognitive predictors of multiteks understanding among elementary students, revealing that students' comprehension varies across text modalities and is differentially influenced by planning, monitoring, and evaluation strategies (Heny, 2025). These findings can be interpreted within the framework of metacognition, which conceptualizes learning as an active process of monitoring and regulating cognitive activities. The results indicate that planning emerges as the most consistent predictor across all text modes. This finding reinforces the central role of planning as an initial metacognitive process that prepares learners to engage with tasks by activating prior knowledge and selecting appropriate strategies (Ghimire & Mokhtari, 2025; Nurtamam & Jannah, 2025). From a cognitive perspective, planning functions as a regulatory mechanism that structures attention and guides information processing before comprehension occurs (Abbas et al., 2024; Ataman & Safitri, 2024). This aligns with metacognitive theory, which positions planning as a foundational component of self-regulated learning, enabling learners to anticipate task demands and allocate cognitive resources effectively.

In contrast, monitoring strategies demonstrated modality-specific effects, being significant in audio and audiovisual contexts but not in written texts. This suggests that real-time comprehension regulation is more actively engaged when learners process dynamic or transient information, such as spoken or multimedia content. Audio and audiovisual texts require continuous updating of understanding, which may trigger more frequent monitoring processes (Zheng et al., 2024; Zulhannan & Musyarrofah, 2024). Conversely, written texts allow for rereading and slower processing, potentially reducing the immediate need for active

monitoring. This finding highlights the interaction between cognitive strategy use and the inherent characteristics of text modalities.

Similarly, evaluation strategies were found to significantly predict comprehension of written and audiovisual texts, but not of audio texts. Evaluation involves reflective judgment and post-processing of information, which may be more feasible in modalities that allow learners to revisit or visually anchor information (Ullah et al., 2022). The absence of a significant relationship in audio texts suggests that limitations in information retention or cognitive load may hinder students' ability to engage in reflective evaluation after listening. This interpretation is consistent with the view that metacognitive regulation depends not only on internal cognitive skills but also on task conditions and representational formats.

The qualitative findings further enrich this interpretation by demonstrating clear differences in strategic behavior across achievement levels. High-achieving students exhibited structured, conscious, and consistent use of strategies, reflecting strong metacognitive awareness (Kosim et al., 2024; Yani et al., 2023). In contrast, lower-achieving students relied on fragmented, reactive approaches, suggesting limited regulation of their cognitive processes (Deriba et al., 2026). These patterns support the notion that metacognition involves both knowledge and regulation of cognition, with effective learners actively monitoring and adjusting their strategies to achieve learning goals.

Taken together, these findings suggest that comprehension strategies function not merely as supportive tools but as cognitive mechanisms underlying multiteks understanding. Variation in strategy effectiveness across modalities indicates that comprehension is a dynamic process shaped by the interaction between cognitive regulation and the nature of the textual input (Obaid et al., 2024; Pu et al., 2021). This extends previous research by demonstrating that the predictive role of metacognitive strategies is context-dependent and modality-sensitive, particularly in elementary education settings (Xiao et al., 2026).

This study has both theoretical and practical implications. Theoretically, it contributes to the literature by positioning comprehension strategies as cognitive predictors within a multiteks framework, thereby extending metacognitive theory into multimodal literacy contexts. Practically, the findings emphasize the importance of explicit instruction in comprehension strategies, particularly in helping students develop planning, monitoring, and evaluation skills tailored to different text modalities. Educators should design learning environments that scaffold metacognitive processes and encourage active regulation of understanding.

Despite its contributions, this study has several limitations. First, the sample size was relatively small and limited to a single school, potentially limiting the generalizability of the findings. Second, the study relied on correlational analysis, which does not fully establish causal relationships. Future research is recommended to employ experimental or longitudinal designs to investigate causal mechanisms further. Additionally, further studies could explore other cognitive variables, such as cognitive load or motivation, to provide a more comprehensive understanding of multiteks comprehension.

## **CONCLUSION**

This study demonstrates that comprehension strategies are closely associated with elementary students' multiteks understanding across written, audio, and audiovisual text modes. Among the three strategies examined, planning showed the strongest and most consistent relationship with comprehension across all modalities, whereas monitoring and evaluation exhibited modality-specific relationships. The qualitative findings further revealed that high-achieving students applied comprehension strategies more systematically and metacognitively than medium- and low-achieving students, highlighting the importance of strategic self-regulation in multiteks comprehension. These findings suggest that effective

understanding of multimodal texts depends not only on students' exposure to diverse forms of information but also on their ability to plan, monitor, and evaluate their own comprehension processes. Therefore, explicit instruction in comprehension strategies should be integrated into elementary literacy education to strengthen students' metacognitive skills and enhance their ability to comprehend multiteks in increasingly multimodal learning environments.

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