

Making Meaning, Solving Problems: A Thematic Analysis of Reading Comprehension and Problem-Solving Skills among Senior High School Learners

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ABSTRACT

This study examines the role of reading comprehension in shaping the problem-solving skills of senior high school learners using a qualitative thematic approach. Grounded in cognitive–constructivist perspectives, it explores how students construct meaning from texts and apply this understanding to solve academic problems. Fifteen Grade 11 and Grade 12 students from Villaba National High School (LNCAST) were purposively selected to represent varying levels of reading comprehension ability. Data were collected through semi-structured interviews, reading-based problem-solving tasks, and reflective responses, and analyzed using Braun and Clarke’s thematic analysis. Findings reveal that reading comprehension

functions as a critical foundation for problem-solving. Two primary patterns emerged: surface-level processing, characterized by keyword scanning and focus on numerical data, and deeper meaning construction, involving re-reading, paraphrasing, and contextual interpretation. Students encountered challenges such as cognitive overload, vocabulary limitations, and misinterpretation of task demands. Conversely, effective strategies—including strategic information filtering, sequential reasoning, metacognitive monitoring, and integration of prior knowledge—enhanced problem-solving performance. The study concludes that reading comprehension serves as a cognitive gateway to problem-solving, influencing learners’ ability to interpret problems and generate logical solutions. These findings highlight the need to integrate reading-focused strategies into instruction to strengthen both literacy and analytical reasoning across disciplines.

Keywords: *Reading comprehension 1, Problem-solving skills, Thematic analysis 3, Cognitive processing 4, Metacognition 5, Cognitive load 6, Information processing 7, Constructivist learning 8*

INTRODUCTION

In an increasingly interconnected and information-rich world, reading comprehension has emerged as a critical academic skill that supports learners’ ability to interpret information, engage in critical thinking, and solve problems across subject areas. Contemporary educational research emphasizes that reading comprehension is an active process of constructing meaning from text, involving the identification of key ideas, integration of information, and application of understanding to novel situations (OECD, 2023; Pastera et al., 2024). These processes are essential for problem-solving tasks that require learners to analyze written scenarios, extract relevant information, and determine appropriate solutions.

At the global level, recent studies and international reports continue to highlight the role of reading comprehension in academic reasoning and problem solving. Findings from the Programme for International Student Assessment (PISA) indicate that students with stronger reading literacy skills are more capable of applying knowledge to unfamiliar and complex problem contexts, while those with weaker comprehension struggle with text-based analytical tasks (OECD, 2023). In addition, UNESCO (2021) reported that learning disruptions during the COVID-19 pandemic have exacerbated existing gaps in reading comprehension worldwide, raising concerns about students' ability to engage meaningfully with problem-based learning tasks. These global trends point to recurring themes of comprehension difficulty, limited transfer of understanding, and challenges in applying textual information to problem solving.

Within the Philippine national context, recent literacy data further underscore these concerns. The Functional Literacy, Education, and Mass Media Survey (FLEMMS) revealed that although basic literacy rates remain high, only 70.8% of Filipinos aged 10 to 64 are functionally literate—able to read, understand, and apply information in everyday contexts (Philippine Statistics Authority [PSA], 2024). The Department of Education has acknowledged that difficulties in reading comprehension affect learners' performance across learning areas, particularly in subjects that require problem interpretation and analytical reasoning, such as mathematics and science (Department of Education [DepEd], 2025). These findings highlight recurring patterns of difficulty in comprehension and application rather than isolated skill deficits.

Recent Philippine studies conducted between 2020 and 2025 provide further evidence of the relationship between reading comprehension and problem-solving performance. Quantitative and mixed-method studies report that learners who demonstrate lower comprehension levels often struggle with word problems and context-based tasks, even when they possess procedural knowledge (Salvo & Uchang, 2025; Pastera et al., 2024). Other studies emphasize that students frequently employ surface-level reading strategies, which limits their ability to analyze problem situations deeply and results in fragmented understanding (Lagdaan & Sevilla, 2025). These studies reveal consistent themes related to strategy use, difficulty in extracting meaning, and challenges in transferring comprehension to problem-solving contexts.

At the local level, including senior high school settings similar to Villaba National High School (LNCAST), school-based assessments and recent studies indicate that many learners experience difficulty when academic tasks require interpreting extended texts, integrating multiple sources of information, or solving problems presented in written form (Delos Reyes & Torres, 2021; Salvo & Uchang, 2025). These patterns suggest that comprehension challenges are not confined to specific subjects but cut across disciplines, reinforcing the need to examine how reading and problem-solving are interconnected in classroom contexts.

While existing studies from 2020 to 2025 have primarily focused on measuring relationships between reading comprehension and academic performance, fewer have examined the recurring patterns of meaning, strategies, and challenges that emerge from students' accounts of engaging with reading and problem-solving tasks. A thematic analysis approach allows for the systematic identification and interpretation of such patterns across learners' responses, providing insights into how reading comprehension supports or constrains problem-solving processes in senior high school education.

Guided by this perspective, the present qualitative study seeks to examine the influence of reading comprehension on senior high school students' problem-solving abilities through thematic analysis. By identifying common themes in students' descriptions of their reading and problem-solving experiences, the study aims to contribute a deeper understanding of how comprehension-related factors shape learners' engagement with academic problems, with implications for instructional practices at Villaba National High School (LNCAST).

Conceptual Philosophy

This study is anchored in a cognitive–constructivist philosophical orientation, which conceptualizes reading comprehension as a foundational mental process that enables learners to interpret, organize, and apply information in problem-solving contexts. The study integrates Cognitive Load Theory, Constructivist Theory, and Information Processing Theory to explain how reading comprehension influences senior high school students’ problem-solving abilities, while employing Braun and Clarke’s thematic analysis as the analytical lens to examine learners’ experiences and meaning-making processes.

From the perspective of Cognitive Load Theory (Sweller, 1988), effective problem solving depends on learners’ ability to manage the limitations of working memory while processing information. Reading comprehension plays a critical role in regulating cognitive load, as learners who can efficiently understand and organize textual information are better able to allocate cognitive resources to reasoning and solution generation. Conversely, poor comprehension increases extraneous cognitive load, overwhelming working memory and hindering problem-solving performance. This theory supports the assumption that difficulties in problem solving may stem not from a lack of conceptual knowledge alone, but from challenges in processing and integrating text-based information.

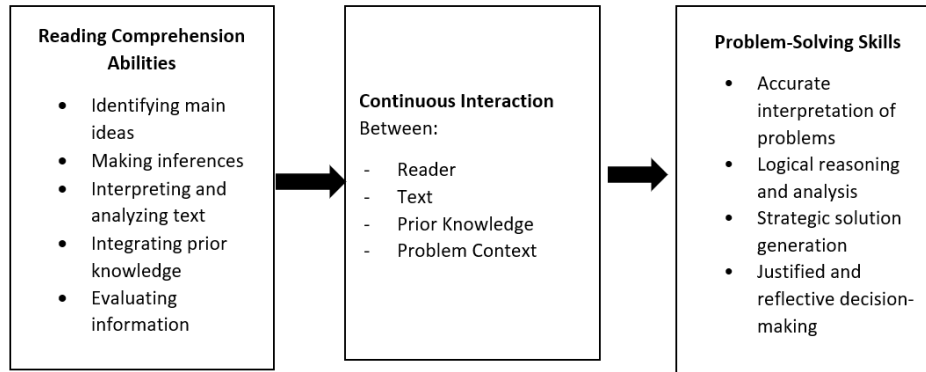
The study is further grounded in Constructivist Theory, drawing on the works of Piaget (1952) and Vygotsky (1978), which posit that learners actively construct knowledge through interaction with information and social contexts. Reading comprehension is viewed as a meaning-making process in which learners interpret texts, connect new information to prior knowledge, and apply understanding to problem situations. Within this framework, problem-solving ability emerges as learners construct solutions based on their comprehension of the problem context. Vygotsky’s emphasis on social interaction and mediation also highlights the role of instructional support and learning environments in shaping students’ comprehension and problem-solving experiences.

In addition, the study incorporates Information Processing Theory, as proposed by Atkinson and Shiffrin (1968), which explains learning as a sequence of cognitive operations involving the encoding, storage, and retrieval of information. Reading comprehension facilitates effective information processing by enabling learners to decode language-based input, organize it within memory structures, and retrieve relevant information during problem-solving tasks. Difficulties in comprehension disrupt this process, resulting in fragmented understanding and ineffective reasoning. This theory reinforces the view that comprehension is a prerequisite for higher-order cognitive functions such as analysis, reasoning, and decision-making.

Consistent with these theoretical perspectives, the study adopts a qualitative interpretivist stance and utilizes Braun and Clarke’s (2021) thematic analysis as its analytical lens. Thematic analysis allows for the systematic identification of recurring patterns, meanings, and strategies in students’ accounts of reading and problem-solving experiences. Rather than quantifying relationships, this approach enables an in-depth exploration of how learners perceive, experience, and navigate comprehension-related challenges in problem-solving contexts. Through the generation of themes, the study interprets how cognitive load, meaning construction, and information processing manifest in students’ real academic experiences.

Overall, the conceptual–theoretical philosophy of this study positions reading comprehension as a central cognitive mechanism that mediates problem-solving ability. By integrating cognitive and constructivist theories and analyzing learners’ experiences through thematic analysis, the study seeks to provide contextually grounded insights into how comprehension influences problem-solving among senior high school students at Villaba National High School (LNCAST), with implications for instructional design and literacy-focused interventions.

Schematic Diagram



Literature Review

Conceptual Literature (Perennial Foundations)

Reading comprehension is widely recognized as a fundamental academic skill that transcends subject areas and significantly influences learners' ability to think critically and solve problems. In the context of senior high school education, comprehension skills are foundational for understanding and analyzing complex information presented in various forms. These skills are particularly important in problem-solving situations that require interdisciplinary thinking and logical reasoning. Recent conceptual frameworks and empirical studies from 2020 to 2025 affirm the strong correlation between reading comprehension and problem-solving abilities, offering valuable insights into how these cognitive functions support and reinforce one another.

Furthermore, reading comprehension is widely recognized as a complex cognitive process that involves decoding, meaning construction, inference-making, and integration of ideas within memory structures. From a cognitive perspective, Sweller (1988) explains through Cognitive Load Theory that learners have limited working memory capacity; thus, inefficient comprehension increases extraneous cognitive load and restricts higher-order problem-solving performance. Expanding this theory, Paas, Renkl, and Sweller (2003) emphasize that instructional design must minimize unnecessary cognitive burden to allow learners to focus on reasoning processes essential for solving complex problems.

Classic cognitive theories laid the groundwork for understanding how language acquisition is intrinsically linked to cognitive development and problem-solving. From a constructivist standpoint, Piaget (1952) asserts that learners actively construct knowledge by assimilating and accommodating new information into existing cognitive schemas. Similarly, Vygotsky (1978) highlights the role of social interaction and scaffolding in meaning-making, emphasizing that comprehension and reasoning develop through guided participation. Bruner (1966) further explains that learning occurs through discovery and active engagement, reinforcing that comprehension enables learners to interpret problem contexts independently.

Further supporting this idea, Bloom's Taxonomy (1956) presents a hierarchical framework of cognitive skills, demonstrating that comprehension is a prerequisite for higher-order thinking such as application, analysis, synthesis, and evaluation. Without a firm grasp of meaning, students cannot effectively engage in complex tasks that demand these advanced cognitive processes. In a similar vein, Anderson and Pearson's (1984) schema theory of reading highlights the role of background knowledge in comprehension. According to this theory, understanding texts involves activating and integrating prior knowledge structures—processes that are also critical in identifying and solving problems.

Cognitive models of comprehension also provide theoretical grounding. Atkinson and Shiffrin (1968), through Information Processing Theory, describe learning as a sequence of encoding, storage, and retrieval. Reading comprehension facilitates effective encoding of textual information, which later supports retrieval during reasoning tasks. Additionally, Kintsch (1998), through the Construction–Integration Model, explains that readers build meaning by integrating textual information with prior knowledge, a process essential for interpreting and solving written problems. Collectively, these perennial theories establish reading comprehension as a foundational cognitive mechanism that mediates analytical reasoning and problem-solving performance.

Additionally, the Concept-Oriented Reading Instruction (CORI) framework developed by Guthrie and colleagues presents a holistic model that integrates reading engagement with content learning. CORI encourages inquiry-based learning by linking reading tasks to real-world concepts, particularly in science education. This model fosters deeper comprehension by prompting students to actively apply their reading to explore and solve problems, thereby cultivating both literacy and cognitive reasoning skills. CORI exemplifies how integrating comprehension with subject matter can simultaneously support reading development and content mastery.

Recognizing the critical role of reading comprehension in overall academic achievement, the Department of Education (DepEd) in the Philippines has implemented various national initiatives aimed at strengthening literacy and cognitive skills among students. The National Reading Program (NRP), formalized through DepEd Memorandum No. 1, s. 2024, supports both remedial and enrichment reading activities across all grade levels. It aims to cultivate independent readers capable of engaging critically with texts and performing complex academic tasks. Complementing this effort, Brigada Pagbasa is a community-based initiative that targets struggling readers through after-school sessions focused on fluency and comprehension, thereby laying the groundwork for logical reasoning.

DepEd has also institutionalized the Philippine Informal Reading Inventory (Phil-IRI) through DepEd Order No. 14, s. 2018. This diagnostic tool allows educators to assess students' reading levels and tailor instruction to meet their specific needs, ensuring that appropriate strategies are employed to support both literacy and problem-solving development. Moreover, the Reading Progress Tool, endorsed in 2021, offers a digital platform that enables teachers to monitor students' reading fluency and comprehension in real-time. The insights gathered through this tool facilitate targeted interventions that enhance both reading and cognitive abilities.

The convergence of enduring theoretical perspectives, contemporary research findings, and national educational programs provides a comprehensive framework for understanding the intricate relationship between reading comprehension and problem-solving. These insights affirm that reading is not merely a linguistic exercise but a multidimensional cognitive process intertwined with reasoning, decision-making, and analytical thinking. The integration of research-based practices into national policies, such as the NRP and Phil-IRI, reflects a systemic commitment to fostering students' cognitive development through literacy education.

Recent international reports reinforce the strong relationship between reading literacy and problem-solving ability. The Organisation for Economic Co-operation and Development (OECD, 2023, 2024), through the PISA 2022 results, found that students with strong reading literacy demonstrate greater capacity to apply knowledge to unfamiliar and complex problem contexts. The reports further note that students with weaker comprehension struggle to extract relevant information from word-based scenarios.

Similarly, findings from the Progress in International Reading Literacy Study (PIRLS 2021) confirm that higher comprehension proficiency correlates with stronger reasoning and analytical performance across countries (Mullis et al., 2021). Global education monitoring reports by UNESCO (2022, 2023) also indicate that literacy gaps continue to affect students' capacity for critical thinking and higher-order problem solving, especially following learning disruptions during the COVID-19 pandemic. These

global trends consistently demonstrate that comprehension is not merely a literacy outcome but a predictor of reasoning competence.

In the Philippine setting, literacy data reveal significant concerns regarding functional comprehension. The Philippine Statistics Authority (2024) reported that while basic literacy rates remain high, functional literacy—defined as the ability to read, understand, and apply information—remains comparatively lower. This gap suggests difficulties in transferring comprehension skills to practical and academic problem-solving contexts.

Noriega, Mendoza, and Cadag (2024) conducted an action research study titled “Enhancing the Word Problem-Solving Skills Through Strengthening Reading Comprehension Skills of Grade 11 Learners.” Their findings revealed that students' difficulties in solving mathematical word problems stemmed largely from poor comprehension of the given texts rather than weak mathematical abilities. The study concluded that strengthening reading comprehension could directly enhance students' problem-solving performance.

Similarly, a quantitative correlational study by Macas et al. (2025) titled “Examining the Relationship Between Reading Comprehension and Word Problem-Solving Skills Among Grade 10 Students” assessed students at Saint Francis of Assisi College. The results showed a low positive correlation ($r = 0.35$, $p = 0.008$) between the two variables, suggesting that while reading comprehension plays a role in solving word problems, other contributing factors also exist. Moreover, Quiambao (2019) explored a similar topic in “Level of Reading Comprehension and Mathematical Problem-Solving Skills of Grade 7 Students of Alfonso National High School.” The research indicated that students with higher reading comprehension levels were more adept at solving mathematical problems. This suggests that enhancing students' reading abilities could improve their academic performance, especially in areas requiring analytical reasoning.

In the study of Jumawin (2019) conducted a study at Palo 19 National High School, revealing that students' poor performance in mathematical problem-solving was linked to limited vocabulary and comprehension skills. The study emphasized the need for targeted interventions to enhance both reading and mathematical competencies. Factors that influence motivation and learning styles according to Manansala and Jimenez (2019), in their study in titled “Motivation and Comprehension in Reading of Senior High School Students,” explored the relationship between motivation and reading comprehension. The research revealed that intrinsic motivation had a moderate correlation with reading comprehension skills, which indirectly affects problem-solving abilities. The study emphasized the importance of motivating learners to read as a means to strengthen comprehension and cognitive performance.

Legaspi et al. (2025) studied the influence of learning styles on reading comprehension in a modular distance learning setting. The study, “Learning Styles and Reading Comprehension in Modular Distance Learning of Grade 12 Senior High School Students,” concluded that various learning styles significantly affect comprehension levels. This implies that educators must consider differentiated instruction to support learners' reading and problem-solving development. Abalita et al. (2019) cited challenges in reading comprehension. He investigated the challenges encountered by Grade 8 students in reading comprehension at Doña Rosario High School in Quezon City. The study identified issues such as skipping words, lack of comprehension, and disinterest in reading, all of which adversely affect academic performance. The researchers recommended parental support and remedial programs to address these challenging.

Technological interventions and reading comprehension according to Day et al. (2024) explored the use of interactive e-books to improve word knowledge and comprehension skills among students. Their study found that digital tools, when designed effectively, can enhance vocabulary acquisition and comprehension, which are critical for problem-solving in various subjects. The Department of Education (2025) likewise acknowledges that reading comprehension difficulties significantly affect learners' performance in content-heavy disciplines such as mathematics and science, particularly in word problem interpretation. Philippine-based literature further emphasizes strategy-based instruction. A systematic

review by Lagdaan and Sevilla (2025) highlights that structured comprehension strategies improve literacy outcomes among junior high school learners. Similarly, Indiongco et al. (2025) demonstrate that critical reading strategies, including questioning and summarizing, enhance deeper engagement with texts—an essential component in solving contextual academic problems.

Empirical research consistently supports the link between reading comprehension and problem-solving ability. Bernardo et al. (2022) identified multiple factors associated with low mathematics performance among Filipino learners, which may include broader academic and cognitive skills such as literacy-related abilities that can indirectly relate to problem-solving. Internationally, Abidin and Riswanto (2012) highlighted Collaborative Strategic Reading (CSR) as an effective strategy for improving reading comprehension, which is essential for understanding complex texts and may indirectly support learners' ability to engage in structured problem-solving tasks such as mathematical word problems. Further research by Kim (2020) demonstrates that reading comprehension depends on hierarchical language and cognitive processes, reinforcing that reasoning performance relies on integrated comprehension mechanisms.

More recent Philippine studies continue to affirm these findings. Macas et al. (2025) report a significant positive relationship between reading comprehension and mathematical word problem-solving among Grade 10 students. Similarly, Boctot, Enriquez, and Yurango (2025) found that inferential and critical comprehension levels predict students' success in solving contextualized mathematics problems.

In another study, Guradillo and Doronio (2025) confirmed a statistically significant relationship between comprehension proficiency and problem-solving skills among secondary students. Action research conducted by Noriega, Mendoza, and Cadag (2024) further reveals that strengthening reading comprehension strategies improves learners' performance in solving word-based problems. Moreover, mixed-method research by Villanueva (2025) demonstrates that reading comprehension significantly influences academic achievement across reasoning-intensive disciplines, suggesting that comprehension serves as a cross-curricular cognitive skill.

The reviewed literature and studies collectively demonstrate that reading comprehension plays a foundational role in academic reasoning and problem-solving. Global assessments (OECD, PIRLS, UNESCO) consistently show that students with higher literacy levels perform better in analytical and context-based tasks. Philippine data further confirm that functional literacy gaps persist, affecting learners' academic reasoning abilities.

While numerous quantitative studies (2020–2025) establish significant correlations between reading comprehension and problem-solving performance, fewer studies explore how students experience comprehension-related challenges in real classroom contexts. Existing research predominantly measures statistical relationships rather than examining the recurring patterns of meaning construction, strategy use, and cognitive processing that underlie students' engagement with text-based problems.

Thus, there remains a need for a qualitative inquiry that explores how senior high school students describe and interpret their reading and problem-solving experiences. By employing thematic analysis, the present study aims to address this gap and provide deeper insight into how comprehension processes shape problem-solving abilities within a specific educational context.

Research Questions

This study aims to explore how reading comprehension influences the problem-solving skills of senior high school students.

Specifically, it seeks to answer the following questions:

1. How do senior high school students describe their reading comprehension experiences when engaging with problem-solving tasks?
2. What challenges do students encounter in understanding and interpreting text-based problem situations?

3. How do students process and manage information from texts when solving mathematics problems?
4. What strategies do students use to construct meaning and arrive at solutions to problem-solving tasks?
5. Based on the emerging themes, how does reading comprehension shape students' problem-solving abilities?

METHODS

Research Design

This study utilized a qualitative research design to explore and understand the relationship between reading comprehension and problem-solving skills among senior high school students. Specifically, it employed thematic analysis as outlined by Braun and Clarke (2006), which allows for the identification, analysis, and interpretation of patterns or themes within qualitative data. This approach was deemed appropriate because it provides a deeper understanding of students' experiences, perceptions, and strategies in both reading comprehension and problem-solving contexts, rather than merely measuring statistical correlations. Through this design, the study aimed to uncover recurring cognitive and metacognitive processes, as well as challenges encountered by students while engaging with text-based problem-solving tasks.

Research Locale

The study was conducted at Villaba National High School (LNCAST), located in Villaba, Leyte. This school was chosen because it offers senior high school programs and represents a diverse student population, providing an appropriate context for examining the reading and problem-solving abilities of learners. The research was carried out during regular school hours, with the consent and cooperation of school administrators, teachers, and participating students.

Participants and Sampling Technique

The participants of the study were Grade 11 and Grade 12 students enrolled in the senior high school program of Villaba National High School (LNCAST). A total of 10–15 purposively selected participants were included to ensure that the data captured a range of experiences with reading comprehension and problem-solving. Purposive sampling was used to select students who demonstrated varying levels of reading comprehension abilities, as determined by prior academic performance and teacher recommendations. This selection ensured that the study included students with diverse perspectives, thereby enhancing the richness of the data.

Research Instrument

The primary instrument for data collection was a semi-structured interview guide designed to elicit participants' experiences, perceptions, and strategies in reading and problem-solving. The interview questions were developed based on the study's objectives and were structured around key themes, including reading comprehension strategies, problem-solving approaches, challenges encountered, and the perceived influence of reading skills on reasoning tasks. Follow-up probing questions were used during interviews to clarify responses and encourage participants to provide detailed explanations. Additionally, observational notes and samples of students' problem-solving exercises were collected to triangulate the data and ensure validity.

Data Gathering

Before the conduct of the study, ethical clearance and permission were obtained from the school administration. Informed consent was secured from participants, and confidentiality was assured. Data collection involved three main steps: First, the selected participants were asked to complete a short reading comprehension activity and a word-problem task to contextualize their experiences. Second, individual interviews were conducted in a quiet and comfortable environment to encourage open responses. Each interview lasted approximately 30–45 minutes and was audio-recorded with participants’ permission. Third, the researcher transcribed the interviews verbatim and reviewed the collected artifacts to ensure completeness and accuracy. Throughout the process, care was taken to maintain the anonymity of participants by using pseudonyms.

Data Analysis

Data were analyzed using thematic analysis, following the six-phase approach of Braun and Clarke (2006): (1) familiarization with the data by reading transcripts and reviewing notes, (2) generating initial codes to identify meaningful data segments, (3) searching for patterns and preliminary themes across participants’ responses, (4) reviewing and refining themes to ensure they accurately represented the data, (5) defining and naming final themes to reflect participants’ experiences, and (6) producing the report by integrating themes with the study’s objectives and literature review. This systematic process ensured that the analysis was rigorous, credible, and aligned with qualitative research standards.

Ethical Consideration

To ensure the trustworthiness of the study, strategies such as triangulation, member checking, and peer debriefing were employed. Triangulation involved comparing interview data with observational notes and student exercises. Member checking allowed participants to review the transcriptions and preliminary themes to verify accuracy. Peer debriefing provided additional perspectives to minimize researcher bias. Ethical considerations included obtaining informed consent, ensuring confidentiality, and respecting participants’ rights to withdraw from the study at any time without penalty.

RESULTS AND DISCUSSION

Research Question 1: How do senior high school students describe their reading comprehension experiences when engaging with problem-solving tasks?

Table 1. *Themes and Codes for RQ1*

Research Question 1	Themes	Representative Codes
Students’ reading experiences	Surface-Level Processing	scanning for numbers, keyword spotting, skipping explanations
	Meaning Construction Through Contextualization	re-reading, paraphrasing, visualizing, connecting to experience

Theme 1: Surface-Level Processing as an Initial Strategy

A recurring pattern in participants’ responses revealed that many students approach problem-solving tasks by scanning for numerical values and keywords before fully constructing meaning from the text. Several participants admitted that they prioritize identifying formulas and given values rather than

interpreting the entire problem scenario. For instance, P3 explained that he “usually looks for the numbers first before reading everything,” while P7 shared that he sometimes “skips the long sentences and just finds the formula.” Similarly, P1 stated that he focuses immediately on the given information and proceeds directly to solving.

This pattern suggests that reading comprehension is sometimes treated as a procedural step rather than an interpretive process. Such surface-level processing reflects a strategy aimed at minimizing cognitive effort. According to Cognitive Load Theory (Sweller, 1988), learners tend to reduce mental strain by focusing on immediately recognizable elements, especially when tasks are perceived as demanding. However, this strategy may limit deeper comprehension necessary for accurate reasoning. This finding aligns with OECD (2023) reports indicating that students with weaker reading literacy often rely on superficial scanning rather than analytical interpretation in complex problem contexts. Similarly, Lagdaan and Sevilla (2025) found that surface-level reading strategies restrict higher-order reasoning in text-based academic tasks.

Theme 2: Meaning Construction Through Active Engagement

In contrast, several participants described engaging deeply with the text before attempting to solve the problem. These students reported re-reading the problem, paraphrasing it in their own words, and visualizing the scenario. P5 mentioned that she reads the problem again “to understand what is really being asked,” while P9 described imagining the situation mentally before solving. P2 emphasized that explaining the problem in her own words helps clarify meaning before proceeding.

These responses illustrate active meaning construction, where students interpret and contextualize information rather than merely extracting data. This supports Constructivist Theory (Piaget, 1952; Vygotsky, 1978), which posits that learners actively build understanding by integrating new information with prior knowledge. Furthermore, Kintsch’s (1998) Construction–Integration Model emphasizes that comprehension requires linking textual input with existing cognitive schemas. Consistent with this, Noriega, Mendoza, and Cadag (2024) found that strengthening comprehension strategies significantly improves students’ performance in solving word-based problems. Thus, deeper engagement with text appears to facilitate stronger reasoning processes.

Research Question 2: What challenges do students encounter in understanding and interpreting text-based problem situations?

Table 2. *Themes and Codes for RQ2*

Research Question 2	Themes	Representative Codes
Challenges in interpreting problems	Cognitive Overload	too many words, confusion, forgetting details
	Vocabulary Barriers	unfamiliar terms, guessing meaning
	Misinterpretation of Task Demands	solving wrong question, overlooking instructions

Theme 3: Cognitive Overload and Textual Density

Participants frequently described experiencing confusion when confronted with lengthy or information-dense word problems. P4 stated that when the problem is “too long,” confusion sets in, while

P8 shared difficulty identifying which details are important. P6 admitted forgetting earlier parts of the problem while reading subsequent sentences.

These responses indicate cognitive overload, where excessive information surpasses working memory capacity. According to Cognitive Load Theory (Sweller, 1988; Paas et al., 2003), extraneous load impairs learners' ability to process essential information necessary for reasoning. This aligns with global findings reported by UNESCO (2023), which highlighted that comprehension difficulties following pandemic-related disruptions have weakened students' ability to engage in higher-order problem-solving tasks. Thus, textual complexity directly affects students' reasoning capacity.

Theme 4: Vocabulary and Language Barriers

Another challenge identified by participants involves difficulty understanding unfamiliar vocabulary and technical terms. P10 explained that some English words are difficult to interpret, while P12 admitted guessing meanings when encountering unfamiliar terms.

This suggests that language barriers disrupt comprehension before reasoning begins. According to Information Processing Theory (Atkinson & Shiffrin, 1968), ineffective encoding of linguistic input prevents accurate storage and retrieval of information for problem-solving. This finding supports Jumawin (2019) and Abalita et al. (2019), who identified vocabulary limitations as key contributors to poor mathematical problem-solving performance. Therefore, linguistic comprehension serves as a gatekeeper to analytical reasoning.

Theme 5: Misinterpretation of Problem Demands

Several participants acknowledged that they sometimes solve the wrong question due to misunderstanding task instructions. P6 described instances of answering based on assumptions rather than analyzing the actual requirement, while P11 admitted overlooking specific conditions in the problem.

This indicates inferential comprehension difficulties, where students may extract details but fail to interpret the intended demand. This finding corroborates Macas et al. (2025), who found that comprehension deficits significantly predict errors in word-problem solving. It further reinforces the study's conceptual framework that accurate interpretation of problems is foundational to logical reasoning.

Research Question 3: How do students process and manage information from texts when solving mathematics problems?

Table 3. *Themes and Codes for RQ3*

Research Question 3	Themes	Representative Codes
Information management strategies	Strategic Filtering	underlining, identifying key details
	Sequential Organization	step-by-step solving, breaking into parts

Theme 6: Strategic Filtering of Relevant Information

Participants described using strategies such as underlining important details and listing given information before solving. P11 reported highlighting significant parts of the problem, while P5 described listing the known values to avoid confusion.

These strategies reflect controlled information processing. According to Anderson and Pearson’s (1984) Schema Theory, effective comprehension involves identifying relevant cues and activating prior knowledge. Similarly, Indiongco et al. (2025) emphasize that structured comprehension strategies improve analytical accuracy. Thus, filtering information reduces extraneous load and enhances reasoning clarity.

Theme 7: Sequential and Structured Reasoning

Students also described breaking problems into manageable steps. P6 shared that solving step-by-step prevents mistakes, while P3 described dividing the problem into smaller components.

This structured approach reflects higher-order thinking consistent with Bloom’s Taxonomy (1956), particularly in the domains of analysis and application. Furthermore, Boctot, Enriquez, and Yurango (2025) found that inferential comprehension predicts structured problem-solving performance. The findings demonstrate that organized reasoning emerges from effective comprehension.

Research Question 4: What strategies do students use to construct meaning and arrive at solutions?

Table 4. *Themes and Codes for RQ3*

Research Question 4	Themes	Representative Codes
Meaning-making strategies	Metacognitive Monitoring	rechecking question, evaluating answer
	Prior Knowledge Integration	recalling examples, connecting to real-life

Theme 8: Metacognitive Monitoring

Participants described reviewing their answers and re-reading questions to ensure correctness. P2 stated that she checks whether her answer makes sense, while P9 rereads the problem after solving.

Metacognitive monitoring reflects advanced comprehension processes. According to OECD (2023), reflective evaluation distinguishes proficient problem-solvers from struggling learners. This also supports Villanueva (2025), who identified self-regulated comprehension as predictive of academic reasoning success.

Theme 9: Integration of Prior Knowledge

Participants reported recalling previous lessons and real-life experiences when solving problems. P8 mentioned remembering similar examples discussed in class, while P4 connected problems to real-life scenarios.

This confirms the interactive model in your conceptual framework—reader, text, and prior knowledge continuously interact. This aligns with Schema Theory (Anderson & Pearson, 1984) and Constructivist Theory (Vygotsky, 1978), emphasizing that knowledge construction depends on contextual integration.

Integrative Discussion (RQ5): How does reading comprehension shape problem-solving abilities?

Across themes, reading comprehension emerged as the foundational mechanism that regulates interpretation, reasoning, and solution generation. Participants consistently indicated that misunderstanding the text leads to incorrect solutions. This confirms that comprehension functions as a cognitive gateway to problem-solving performance.

Students who engaged in surface processing experienced misinterpretation and overload, whereas those who constructed meaning actively demonstrated structured reasoning and reflective evaluation.

These results converge with global and Philippine literature (OECD, 2023; Macas et al., 2025; Noriega et al., 2024), reinforcing that reading comprehension is not merely supportive but foundational to reasoning competence.

CONCLUSION

Based on the findings, the study draws the following conclusions:

1. Reading comprehension is a foundational cognitive mechanism in problem-solving. It functions as a gateway that determines the accuracy of interpretation and the quality of reasoning.
 2. Surface-level strategies limit analytical performance.
 3. Students who prioritize keyword spotting over contextual understanding are more vulnerable to misinterpretation.
 4. Cognitive load and vocabulary gaps significantly influence reasoning outcomes.
 5. Textual complexity directly affects students' working memory and analytical capacity.
 6. Metacognitive regulation strengthens reasoning competence.
 7. Students who monitor and evaluate their comprehension demonstrate more structured and reflective problem-solving.
 8. The cognitive–constructivist framework is empirically supported.
 9. The integration of Cognitive Load Theory, Constructivist Theory, and Information Processing Theory effectively explains how comprehension mediates reasoning.
- Overall, reading comprehension is not merely supportive of problem-solving—it is central to it.

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