

## Instructional quality, student motivation and assistive technology: Implication on students' higher order comprehension skills

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### Abstract

**Aim:** This study examined Grade 7 students' reading motivation, perceived quality of reading instruction, and utilization of assistive technology as predictors of their higher-order comprehension skills. Specifically, it assessed students' levels of motivation, instructional quality, and assistive technology use, and evaluated their abilities in making inferences, predictions, and drawing conclusions.

**Methodology:** A descriptive-correlational research design was employed involving 221 Grade 7 students from two public high schools selected through systematic random sampling. Data were collected using expert-validated and pilot-tested survey questionnaires and a PHIL-IRI-based reading comprehension test. Descriptive statistics and canonical correlation analysis were used to examine the relationships among the variables.

**Results:** The findings revealed that only the quality of reading instruction demonstrated a statistically significant, although weak, relationship with students' higher-order comprehension skills. Instructional quality showed a modest contribution to students' ability to make inferences, predictions, and draw conclusions. In contrast, reading motivation and assistive technology utilization showed negligible and non-significant associations with higher-order comprehension skills.

**Conclusion:** The study concludes that instructional quality plays a critical role in developing students' higher-order comprehension skills. While reading motivation and assistive technology may support engagement, they do not independently predict advanced comprehension outcomes. The findings highlight the importance of structured, scaffolded, and evidence-based reading instruction, as well as school-based literacy interventions and continuous professional development for teachers to strengthen students' critical and analytical reading abilities.

**Keywords:** *higher-order comprehension, reading instruction, reading motivation, assistive technology, reading proficiency, literacy intervention*

### INTRODUCTION

Reading proficiency was recognized as a fundamental skill that supported students' academic success across all subject areas. In the Philippine educational context, Grade 7 represented a critical transitional stage, as students moved from elementary to junior high school and encountered increasingly complex English texts. At this level, students were expected to read in order to learn, which necessitated the development of higher-order comprehension skills, including making inferences, making predictions, and drawing conclusions.

Despite the significance of reading in the K–12 curriculum, national and international assessments indicated that many Filipino students continued to struggle with reading comprehension. The Programme for International Student Assessment (PISA) reported that the Philippines ranked among the lowest-performing countries in reading literacy (OECD, 2023). Complementing these findings, results from the Philippine Informal Reading Inventory revealed that a considerable proportion of Filipino learners remained at instructional and frustration reading levels, particularly in English comprehension. In response to these challenges, the Department of Education (DepEd) strengthened literacy interventions through programs such as Every Child a Reader Program (ECARP) and Brigada Pagbasa (DepEd, 2017; DepEd, 2022). The implications of weak reading comprehension extended beyond academic performance. In a knowledge-driven society, literacy was closely linked to employability, economic competitiveness, and civic engagement. Students who failed to develop strong reading skills were likely to experience difficulties in higher education, encounter limited career opportunities, and face challenges accessing critical information necessary for personal and social development. For the Philippines,

strengthening reading comprehension in junior high school was therefore both an educational priority and a critical factor in national development and global competitiveness.

Yurko and Protsenko (2021) described reading comprehension as a complex cognitive process emerging from the interaction among the reader, the text, and prior knowledge. Effective reading comprehension instruction for adolescent learners involves explicit teaching of strategies such as summarizing, questioning, predicting, and activating prior knowledge, often integrated across content areas like science and social studies to improve understanding (Cantrell et al., 2022).

Higher-order comprehension skills enable students to move beyond surface-level understanding and engage critically with texts through inference, prediction, and drawing conclusion. However, many Grade 7 learners, particularly those from English-poor homes, continue to demonstrate deficiencies in these skills (Gallagher, 2023). The consequences of poor reading comprehension were also evident at classroom and community levels. Teachers were compelled to address wide learning gaps within a single class, limiting opportunities to develop higher-order competencies. Students with reading difficulties exhibited low confidence, reduced engagement, and reluctance to participate in academic activities, which could result in frustration, disinterest, and poor academic outcomes. In the context of Philippine public junior high schools, these challenges were further compounded by large class sizes, limited access to varied and leveled reading materials, and the transition from mother tongue-based instruction in elementary grades to English as the primary medium of instruction. In rural and economically disadvantaged communities, limited literacy skills further restricted access to vital information, constraining learners' ability to engage fully in civic and social life. Adolescent literacy development requires not only decoding skills but also advanced competencies in vocabulary, morphology, academic language, and disciplinary literacy (Yaylali, 2024).

Although the Department of Education implemented various literacy programs, and other school-based reading interventions, existing research in the Philippine context has largely focused on general reading proficiency and basic comprehension outcomes. However, limited studies have comprehensively examined the combined influence of key factors such as reading motivation, quality of reading instruction, and assistive technology utilization on the development of higher-order comprehension skills among Grade 7 learners.

Several factors were identified as influencing higher-order comprehension skills, including reading motivation, the quality of reading instruction, and the use of assistive technology. Motivation determined students' willingness to engage with texts, yet cognitive effort and structured instruction were necessary to develop advanced comprehension skills. Quality instruction involved explicit teaching of strategies, guided practice, discussion, and constructive feedback, which enabled learners to become confident and independent readers. Recent advancements in educational technology show that AI-supported reading interventions, when combined with guided instruction, can foster comprehension, engagement, and self-regulated learning (Fu & Hiniker, 2025). Assistive technology, such as text-to-speech applications, audiobooks, and digital glossaries, provided additional support, but its effectiveness depended on guided and purposeful integration into learning activities.

Addressing higher-order comprehension skills aligned with the objectives of Sustainable Development Goal 4, which emphasized inclusive and quality education and the promotion of lifelong learning opportunities. Strengthening reading comprehension among Grade 7 students not only supported individual academic success but also contributed to broader educational, social, and economic outcomes at national and global levels.

Given these considerations, it became necessary to examine the higher-order comprehension skills of Grade 7 learners and the factors associated with their development and provide evidence-based insights for educators and policymakers.

### Review of Related Literature and Studies

This review of related literature integrates both theoretical perspectives and empirical studies on higher-order comprehension skills among Grade 7 learners, with particular focus on making inferences, making predictions, and drawing conclusions within the Philippine educational context and comparable international settings. The literature underscores persistent challenges in the development of these skills, with learners' performance often falling below expected proficiency levels. These difficulties are influenced by a combination of factors, including reading motivation, the quality of instruction, and access to assistive technology. Collectively, the reviewed studies highlight the critical role of well-structured instructional support, learner engagement, and appropriate technological integration in fostering advanced comprehension and improving learning outcomes.

Recent large-scale assessments and syntheses emphasize the role of vocabulary knowledge, metacognitive strategies, and disciplinary literacy in improving comprehension outcomes (Duke & Cartwright, 2021). Additionally, systemic factors such as curriculum demands, instructional time, and digital access inequalities continue to influence reading performance across contexts (UNESCO, 2023). Despite these insights, gaps remained regarding the integration of motivation, instructional practices, and assistive technology in localized Philippine settings.

### Level of Performance in Higher-Order Comprehension Skills

Higher-order comprehension skills, which include making inferences, making predictions, and drawing conclusions, extend beyond literal understanding and require complex cognitive processes. Contemporary models highlight that comprehension depends on the interaction of decoding, language comprehension, background knowledge, and strategic processing (Duke & Cartwright, 2021).

Within the Philippine context, the transition from elementary to junior high school under the K–12 curriculum places greater emphasis on the development of advanced reading competencies. Despite this, recent assessments continue to highlight significant literacy challenges. Results from the Programme for International Student Assessment (PISA) indicate that Filipino learners perform below the international average in tasks involving critical analysis and inferential thinking. Similarly, Department of Education (DepEd) reports show that only 31% of Grade 7 students reach grade-level proficiency in reading comprehension, with notable regional disparities. Moreover, many learners experience difficulty with higher-order comprehension tasks, particularly in making inferences and drawing conclusions, underscoring the need to enhance instructional support for these skills across diverse Philippine classrooms.

### Making Inferences

Inferential comprehension involves integrating textual evidence with prior knowledge to construct meaning beyond what is explicitly stated. Research indicates that inference-making is closely linked to vocabulary depth, background knowledge, and overall language comprehension, with learners possessing richer linguistic resources demonstrating stronger inferential abilities (Duke & Cartwright, 2021). Effective instructional approaches—such as think-aloud strategies, reciprocal teaching, and explicit comprehension strategy instruction—have been shown to enhance these skills. However, classroom practices often remain focused on literal recall, limiting opportunities for higher-order thinking. International assessments further reveal that many classrooms continue to underemphasize inferential and analytical reading tasks, resulting in fewer opportunities for students to engage in deeper comprehension processes (OECD, 2023)

### Making Predictions

Prediction skills support active engagement and comprehension. A recent meta-analysis confirmed that reading strategies, including prediction, were strongly correlated with comprehension outcomes (Sun et al., 2021). Technology-delivered literacy instruction has been shown to improve reading comprehension by supporting engagement, cognitive processing, and comprehension monitoring compared to traditional methods (Capodiecici et al., 2020).

### Drawing Conclusions

Drawing conclusions involved synthesizing evidence and reasoning logically. Recent meta-analyses showed that inference and drawing conclusion skills were critical predictors of reading comprehension (Sun et al., 2021). Classroom assessments, however, often underrepresented higher-order reasoning tasks, focusing more on recall than evaluative reasoning (Heitink et al., 2021).

### Reading Motivation

Reading motivation, comprising intrinsic and extrinsic factors, self-efficacy, and task value, influenced engagement, persistence, and depth of processing grounded in Self-Determination Theory and Expectancy-Value Theory, motivation was linked to higher comprehension and sustained engagement. Gender differences in reading motivation were also documented, with interventions suggesting higher reading motivation in females (Lesperance et al., 2022).

### Instructional Quality

High-quality reading instruction included explicit strategy instruction, vocabulary development, and inferential reasoning, which are essential for improving comprehension outcomes (Zeng et al., 2025). Research shows that vocabulary knowledge, reading strategies, and motivation significantly predict reading comprehension performance among learners, while integrated vocabulary instruction enhances comprehension development.

However, instructional challenges such as limited time, resource constraints, and the need for effective teaching approaches continue to affect implementation. Studies emphasize that explicit and well-structured vocabulary instruction improves both reading comprehension and related literacy skills. Furthermore, innovative approaches such as corpus-driven and technology-supported vocabulary instruction have been shown to significantly enhance learners' comprehension and engagement (Zhang, 2024).

Additionally, recent research highlights the strong relationship between vocabulary knowledge and inferential comprehension, confirming that learners with higher vocabulary proficiency demonstrate better comprehension skills

(Royeras & Sumayo, 2024). These findings underscore the importance of integrating vocabulary development, strategy instruction, and innovative teaching approaches to improve reading outcomes in diverse learning contexts. School library support further strengthens literacy integration across subject areas (Merga, 2023).

### Assistive Technology

Assistive technology (AT) enhanced accessibility and engagement, particularly for learners with reading difficulties, through tools such as text-to-speech systems, adaptive reading platforms, and interactive applications. Emerging studies further highlight the effectiveness of artificial intelligence (AI), indicating that AI-supported interventions can significantly enhance students' comprehension, engagement, and self-regulated learning (Rad, 2025; Silor & Silor, 2025). Multimedia and mobile learning approaches also contribute to improved comprehension and motivation by integrating interactive and flexible learning environments (Lifana et al., 2024; Alqahtani, 2024). However, digital inequities and insufficient teacher training restricted widespread adoption of assistive technology in Philippine schools (U.S. Department of Education, 2024). Furthermore, the interaction between assistive technology use and motivational constructs remains underexplored in current literature.

### Theoretical Framework

The conceptual framework illustrated how reading motivation, instructional quality, and assistive technology use collectively influenced higher-order comprehension skills in Grade 7 learners. Higher-order comprehension, the primary outcome, encompasses making inferences, predicting, and drawing conclusions. Reading motivation includes intrinsic and extrinsic factors that sustain engagement, attention, and persistence, while instructional quality incorporates guided practice, explicit strategy instruction, scaffolding, and culturally responsive materials. Assistive technology refers to digital tools that facilitate text access and support comprehension. These factors were conceptualized as independent yet interacting determinants of advanced reading performance.

The framework integrated cognitive, social, and linguistic perspectives. Cognitive Development Theory, which explained that learners' comprehension abilities evolved as their thinking processes matured; Sociocultural Theory, which emphasized learning through social interaction and guided practice; and Schema Theory, which posited that comprehension improved when learners activated prior knowledge. The Simple View of Reading further explained that reading comprehension resulted from the interaction between decoding and language comprehension. By positioning motivation, instruction, and technology as key determinants of higher-order comprehension, the framework provided a structured basis for examining variable interactions and guiding targeted interventions to enhance advanced reading skills in junior high contexts.

### Conceptual Framework

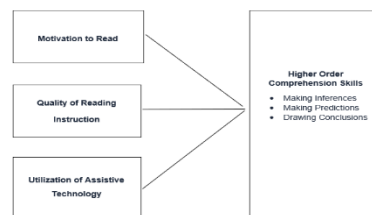


Figure 1. Schematic Presentation showing the interplay of the variables of the study

The study's conceptual framework illustrated the relationships among reading motivation, quality of instruction, assistive technology use, and Grade 7 students' higher-order comprehension skills, which included making inferences, predictions, and drawing conclusions. Reading motivation encompassed intrinsic and extrinsic factors sustaining engagement and persistence, while instructional quality involved explicit strategy instruction, guided practice, scaffolding, and culturally responsive materials. Assistive technology referred to digital tools and applications that facilitated text access and supported comprehension. These factors were conceptualized as independent yet interacting determinants of advanced reading performance.

Grounded in Cognitive Development Theory, Schema Theory, and the Simple View of Reading, the framework highlighted the roles of cognitive readiness, prior knowledge activation, and balanced decoding-comprehension processes in shaping comprehension outcomes.

### Statement of the Problem

Reading comprehension is essential for academic success, particularly in junior high school where learners transition from “learning to read” to “reading to learn.” Despite ongoing literacy initiatives in the Philippines, many Grade 7 students continue to experience difficulties in higher-order comprehension skills, including making inferences, generating predictions, and drawing evidence-based conclusions. These challenges are influenced by several factors, including students’ motivation to read, variations in the quality of reading instruction, and the limited integration of assistive technology in classroom learning environments. Additional contributing factors include insufficient teacher preparation, limited access to culturally relevant reading materials, and inadequate use of digital tools that support reading comprehension.

Although structured reading programs, guided instructional strategies, and digital resources have been introduced in some schools, higher-order comprehension skills among junior high school learners remain insufficiently developed. This situation suggests that multiple interacting factors—such as reading motivation, instructional quality, and assistive technology utilization—may influence students’ reading achievement and comprehension development.

Therefore, it is necessary to systematically examine Grade 7 students’ motivation to read, their perceptions of the quality of reading instruction, and their utilization of assistive technology in relation to their higher-order comprehension skills. Understanding these relationships will provide valuable insights for educators and policymakers in designing evidence-based instructional interventions and literacy programs aimed at strengthening advanced reading skills and improving students’ academic performance.

### Research Objectives

#### General Objective

To examine the relationship between motivation to read, quality of reading instruction, utilization of assistive technology, and the higher-order comprehension skills of Grade 7 students.

#### Specific Objectives

1. To determine the level of motivation to read among Grade 7 students.
2. To assess students’ perceptions of the quality of their teachers’ reading instruction.
3. To identify the extent of students’ utilization of assistive technology in reading activities.
4. To evaluate the level of students’ higher-order comprehension skills in terms of:
  - 4.1 Making inferences
  - 4.2 Making predictions
  - 4.3 Drawing conclusions
5. To examine the significant relationships between motivation to read, quality of reading instruction, utilization of assistive technology, and students’ higher-order comprehension skills.

#### Research Questions

1. What is the level of motivation to read among Grade 7 students?
2. What are the students’ perceptions of the quality of their teachers’ reading instruction?
3. What is the extent of students’ utilization of assistive technology in reading activities?
4. What is the level of students’ higher-order comprehension skills in terms of:
  - 4.1 Making inferences
  - 4.2 Making predictions
  - 4.3 Drawing conclusions
5. Is there a significant relationship between motivation to read, quality of reading instruction, utilization of assistive technology, and students’ higher-order comprehension skills?

#### Hypotheses

Ho1: There is no significant relationship between students’ motivation to read and their higher-order comprehension skills.

Ho2: There is no significant relationship between the quality of reading instruction and students’ higher-order comprehension skills.

Ho3: There is no significant relationship between the utilization of assistive technology and students’ higher-order comprehension skills.

## METHODS

### Research Design

This study utilized a descriptive-correlational research design, which was appropriate for examining the relationships among selected variables without manipulation. The correlational approach enabled the researcher to determine the degree and direction of associations among the quality of reading instruction, students' motivation to read, utilization of assistive technology, and their reading proficiency. This design also allowed for the systematic collection and analysis of quantitative data to identify patterns and trends objectively.

The descriptive component of the study focused on presenting the current status of these variables among Grade 7 students within the selected school district. Specifically, it described how the quality of reading instruction, reading motivation, and the use of assistive technology relate to students' comprehension skills. Through this approach, the study provided an evidence-based understanding of how these factors interact and contribute to reading development, thereby offering insights that may inform future instructional improvements and targeted literacy interventions.

### Population and Sampling

This study targeted Grade 7 students from two public high schools in the District of Bukidnon, a province in the Philippines, with a total population of 364 learners. Students represented diverse academic levels, backgrounds, and reading experiences. Systematic random sampling was used to select 221 participants—176 from District 1 (of 313 learners) and 45 from District 2 (of 51 learners). Systematic random sampling was employed by determining a sampling interval and selecting a random starting point to ensure unbiased participant selection. This approach ensured balanced and representative data on reading motivation, instructional quality, assistive technology use, and higher-order comprehension skills. No additional data sources were utilized, as the study relied exclusively on primary data collected from the selected student respondents.

### Instruments

Data were collected using a validated researcher-developed survey questionnaire and the Philippine Informal Reading Inventory (Department of Education [PHIL-IRI], 2018). The survey measured motivation to read, quality of reading instruction, and use of assistive technology, with 10 indicators per variable rated on a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). It was developed from relevant literature and aligned with the study's objectives. Three experts in educational research, assessment, and instructional design reviewed the instrument for content clarity, relevance, and comprehensiveness. Reliability was confirmed through a pilot test, yielding a Cronbach's alpha of 0.78.

Higher-order comprehension skills—making inferences, predicting, and drawing conclusions—were assessed using the Philippine Informal Reading Inventory (Department of Education [PHIL-IRI], 2018) and a researcher-developed reading comprehension test. The PHIL-IRI is a standardized tool widely used in the Philippines to assess students' reading abilities across various skills, including comprehension, fluency, and decoding. The researcher-developed test contained 21 multiple-choice items, with seven items per subskill, based on short passages to evaluate students' ability to analyze and apply textual information. Items were scored objectively, and subskill scores were aggregated to determine overall comprehension performance. Both instruments were administered in a supervised classroom setting, and students were given sufficient time to ensure accurate responses.

### Data Collection

Data were collected during the School Year 2025–2026, specifically from October - December 2025, following approval from the institution's Research Ethics Committee. Formal letters were sent to the principals of the selected public high schools in the District of Bukidnon, Philippines, and coordination with class advisers ensured proper scheduling of data collection sessions.

The validated survey questionnaire and reading comprehension test were administered both in person in the classroom to accommodate participants' schedules and maximize response rates. Clear instructions and explanations of the study's objectives were provided to ensure students' understanding of the tasks. All responses were carefully collected, organized, and securely stored to maintain data integrity and confidentiality for subsequent analysis.

### Treatment of Data

Data collected to address the first four research problems were analyzed using descriptive statistics, including frequency, percentage, mean, and standard deviation, to summarize students' responses on motivation to read, quality of reading instruction, utilization of assistive technology, and higher-order comprehension skills (making inferences, making

predictions, and drawing conclusions). Assumptions underlying these computations were checked to ensure validity and reliability.

Normality was tested using the Kolmogorov–Smirnov and Shapiro–Wilk tests. Results showed that motivation to read, quality of reading instruction, and the comprehension subskills deviated from normal distribution ( $p < .05$ ), while assistive technology was normally distributed (Shapiro–Wilk  $p = .291$ ). The large sample size ( $n = 221$ ) justified the use of parametric procedures.

To examine the fifth research problem, canonical correlation analysis was applied to determine the multivariate relationships between motivation, instructional quality, and assistive technology with higher-order comprehension skills. Assumptions of linearity, multicollinearity, and homoscedasticity were verified. The results informed evidence-based conclusions and recommendations to enhance reading comprehension among Grade 7 students.

### Ethical Considerations

The study adhered to the Belmont Report principles of Respect for Persons, Beneficence, and Justice (U.S. Department of Health and Human Services, 1979). Institutional Review Board approval was obtained prior to data collection. Informed consent was secured from all participants and their guardians, ensuring voluntary participation and the right to withdraw without penalty. Instruments were age-appropriate and non-invasive to minimize risk. Confidentiality was maintained through secured physical records and encrypted digital files. Data were responsibly disposed of post-study, safeguarding participants' rights, welfare, and autonomy.

### RESULTS and DISCUSSION

This section provides the results and discussion on Grade 7 students' reading motivation, perceived reading instruction, use of assistive technology, and higher-order comprehension skills. The results were presented according to the research questions, supported by descriptive statistics, and interpreted in light of relevant literature to highlight implications for reading instruction and literacy development.

#### 1. Frequency Distribution and Descriptive Statistics of Motivation in Reading

The results revealed that "I feel proud when I finish reading a challenging text" obtained the highest mean (4.18, Agree), indicating that students are motivated by a sense of accomplishment when completing difficult reading tasks. This suggests that experiences of success reinforce engagement and confidence in reading. According to Ryan and Deci (2020), feelings of competence enhance intrinsic motivation and support sustained learning behaviors.

Table 1  
*Frequency Distribution and Descriptive Statistics of Motivation in Reading*

No.	Statements	Mean	Description	SD
1	I enjoy reading books or articles even when they are not required in school.	3.43	Neutral	1.08
2	I read to learn new things about topics that interest me.	3.85	Agree	1.00
3	I feel proud when I finish reading a challenging text.	4.18	Agree	0.94
4	I read because it helps me achieve higher grades.	4.08	Agree	0.96
5	I feel proud when I understand what I read.	4.10	Agree	1.01
6	I read because it helps me get better grades.	3.87	Agree	1.10
7	I participate in reading activities outside school, such as reading clubs or community programs.	3.48	Neutral	1.15
8	My family encourages me to read at home.	3.71	Agree	1.21
9	I choose to read in my free time.	3.49	Neutral	1.28
10	I feel satisfied when I finish reading a book.	3.83	Agree	1.13
Overall		3.80	Agree	0.62

Scale (Mean Range)	Description	Interpretation
4.21 – 5.00	Strongly Agree	Very High
3.41 – 4.20	Agree	High

3.40	2.61	-	Neutral / Undecided	Moderate
2.60	1.81	-	Disagree	Low
1.80	1.00	-	Strongly Disagree	Very Low

This was followed by "I feel proud when I understand what I read" (Mean = 4.10) and "I read because it helps me achieve higher grades" (Mean = 4.08), indicating that both comprehension and academic outcomes influence students' motivation. Similarly, "I read to learn new things about topics that interest me" (Mean = 3.85) reflects the role of personal interest in sustaining engagement. These findings support the view of Cremin and Scholes (2024), that motivated readers tend to engage more actively with texts.

On the other hand, "I choose to read in my free time" (Mean = 3.49) and "I enjoy reading even when it is not required for school" (Mean = 3.48–3.43) received the lowest ratings, interpreted as Neutral. This indicates that students' motivation to read is more evident in structured academic settings than in voluntary reading situations. As emphasized by Johri (2024), recreational reading contributes to creativity and deeper literacy development.

Overall, the composite mean of  $M = 3.80$ ,  $SD = 0.62$  indicates that Grade 7 students demonstrate a generally high level of reading motivation. However, the relatively lower engagement in independent reading suggests the need to further promote reading beyond academic requirements to strengthen intrinsic motivation. Findings also suggest that students with higher motivation demonstrate stronger comprehension skills (Li & Gan, 2022).

## 2. Frequency Distribution and Descriptive Statistics of Teachers' Quality of Reading Instruction

The results revealed that "My teacher explains reading strategies clearly" obtained the highest mean (4.24, Agree), indicating that students perceive explicit instruction as a strong support in understanding texts. Clear explanation of strategies such as identifying main ideas and making inferences may help learners approach reading tasks with greater confidence. This supports the view of Pressley et al. (2023), that effective instructional practices enhance comprehension and academic outcomes.

Table 2

Frequency Distribution and Descriptive Statistics of Teachers' Quality of Reading Instruction

No.	Statements	Mean	Description	SD
1	My teacher explains reading strategies (e.g., finding main ideas, making inferences) clearly.	4.24	Agree	0.95
2	My teacher provides feedback that helps me improve my reading skills.	4.17	Agree	0.90
3	My teacher uses strategies which help me understand what I read.	4.12	Agree	0.87
4	My teacher encourages me to ask questions.	3.84	Agree	1.09
5	My teacher adjusts lessons for students who struggle with reading.	3.85	Agree	1.12
6	My teacher gives clear instructions during reading activities.	4.16	Agree	1.00
7	I am given reading materials that match my reading level.	3.87	Agree	1.02
8	I read a variety of texts such as stories, articles, and poems.	3.86	Agree	1.06
9	I learn better when difficult words in the reading materials are simplified.	3.80	Agree	1.02
10	Our teacher teaches us how to understand difficult words.	4.16	Agree	1.06
	Overall	4.01	Agree	0.61

Scale (Mean Range)	Description	Interpretation
5.00	4.21 -	Strongly Agree / Very High
4.20	3.41 -	Agree / High
3.40	2.61 -	Neutral / Undecided / Moderate
2.60	1.81 -	Disagree / Low

1.80      1.00      –      Strongly Disagree      Very Low

This was followed by “My teacher provides feedback that helps me improve my reading skills” (Mean = 4.17) and “My teacher gives clear instructions during reading activities” (Mean = 4.16), suggesting that structured guidance and constructive feedback contribute to students’ learning. Similarly, “Our teacher teaches us how to understand difficult words” (Mean = 4.16) and “My teacher uses strategies which help me understand what I read” (Mean = 4.12) highlight the role of strategic instruction in strengthening comprehension skills.

On the other hand, “My teacher encourages me to ask questions” (Mean = 3.84) and “My teacher adjusts lessons for students who struggle with reading” (Mean = 3.85) received relatively lower ratings, although still interpreted as Agree. These findings suggest that while instruction is generally supportive, there may be opportunities to enhance student participation and provide more differentiated support.

Overall, the composite mean of 4.01 (SD = 0.61) indicates that students perceive the quality of reading instruction as high. The positive evaluations suggest that instructional clarity and guidance contribute to better engagement with reading tasks, although strengthening opportunities for questioning and individualized support may further enhance learning outcomes.

### 3. Frequency Distribution and Descriptive Statistics of Utilization of Assistive Technology

The statement “I find it easier to read when the content includes pictures or videos” obtained the highest mean (3.67, Agree), indicating that students benefit from visual supports in understanding texts. This suggests that multimedia elements may enhance comprehension and engagement, particularly for learners who encounter difficulties in reading. Technology integration in reading instruction has been found to improve comprehension outcomes and learner engagement across various educational contexts (Zhang & Liu, 2021). Similarly, “My school provides assistive technology for students who need it” (Mean = 3.61) and “I feel more confident reading when I can hear the words read aloud” (Mean = 3.57) highlight the supportive role of assistive tools such as audio features and visual materials. These findings align with Mayer (2020), whose Multimedia Learning Theory emphasizes that combining text with audio and visuals improves understanding and retention.

Table 3  
*Frequency Distribution and Descriptive Statistics of Utilization of Assistive Technology*

No.	Statements	Mean	Description	SD
1	I use apps/software (e.g., text-to-speech, videos) to help me read.	3.22	Neutral	1.24
2	Digital tools (e.g., audiobooks, annotation apps) improve my reading comprehension.	3.32	Neutral	1.13
3	My school provides assistive technology (e.g., screen readers) for students who need it.	3.61	Agree	1.09
4	I prefer reading on devices (e.g., tablets, computers) over printed books.	3.29	Neutral	1.17
5	I use technology to solve reading challenges (e.g., unfamiliar words).	3.49	Neutral	1.16
6	I can focus more when I read using a digital device.	3.25	Neutral	1.14
7	I understand difficult words better with the help of reading apps or glossaries.	3.37	Neutral	1.09
8	I find it easier to read when the content includes pictures or videos.	3.67	Agree	1.08
9	I use mobile phones or tablets for reading in school.	2.80	Neutral	1.32
10	I feel more confident reading when I can hear the words read aloud.	3.57	Agree	1.12
Overall		3.36	Neutral	0.61

Scale (Mean Range)	Description	Interpretation
4.21 – 5.00	Strongly Agree	Very High
3.41 – 4.20	Agree	High
2.61 – 3.40	Neutral / Undecided	Moderate

2.60	1.81	-	Disagree	Low
1.80	1.00	-	Strongly Disagree	Very Low

On the other hand, "I use apps/software to help me read" (Mean = 3.22), "I can focus more when I read using a digital device" (Mean = 3.25), and "I prefer reading on devices over printed books" (Mean = 3.29) received relatively lower ratings, all interpreted as Neutral. These results suggest that although assistive technology is available, students may not yet fully integrate it into their regular reading practices. Limited familiarity or confidence in using digital tools independently may contribute to this pattern.

Overall, the composite mean of 3.36 (SD = 0.61) indicates a moderate level of assistive technology use among students. While audiovisual tools appear to enhance comprehension and confidence, the neutral responses toward independent use suggest that technology has not yet been fully embedded into daily reading habits. This supports findings from recent meta-analyses indicating that digital reading interventions significantly enhance comprehension when supported by structured instructional guidance (Pasqualotto et al., 2025).

#### 4. Participants' level of higher order comprehension skills in terms of:

##### 4.1 Making Inferences

The results showed that students' ability in *making inferences* obtained a mean of 4.87, interpreted as Good, indicating that learners are generally capable of understanding implied meanings in texts. This suggests that students can connect ideas, recognize textual clues, and construct logical interpretations beyond explicitly stated information. Such skills are essential for deeper comprehension and critical engagement with reading materials. As noted by Rice et al. (2023), inference-making supports advanced comprehension by enabling readers to interpret underlying meanings and relationships within texts.

Table 4

*Frequency Distribution of Higher Order Comprehension Skill in terms of Making Inferences*

Score Range	Interpretation	Frequency	Percentage
6.01 – 7.00	Outstanding	67	30.32
5.01 – 6.00	Very Good	40	18.10
4.00 – 5.00	Average	60	27.15
2.00 – 3.00	Fair	35	15.84
1.00 – 1.99	Poor	19	8.60
<b>Total</b>		<b>221</b>	<b>100</b>
<b>Mean</b>		<b>4.87</b>	
<b>Interpretation</b>		<b>Good</b>	
<b>SD</b>		<b>2.08</b>	

A closer look at the distribution reveals that 30.32% of students achieved an Outstanding level, while 27.15% performed at the Average level and 18.10% reached the Very Good level. This pattern indicates that a considerable portion of the class demonstrates strong inference skills, which may contribute to more meaningful discussions and improved engagement during reading activities. According to Delariarte et al. (2024), the use of animated short stories provides a meaningful way to strengthen students' inferential comprehension skills, allowing them to better interpret implicit ideas in texts.

However, the relatively wide standard deviation (SD = 2.08) suggests variability in students' abilities, indicating that while many learners perform well, others may still need support in developing inference skills. Overall, the findings highlight that making inferences is a developing strength among students. This aligns with recent research emphasizing inference-making as a critical component of reading development, underscoring its role in higher-order comprehension (Barth et al., 2024).

##### 4.2 Making Predictions

The results indicated that students' ability in *making predictions* obtained a mean of 2.74, interpreted as Fair, suggesting that many learners still experience difficulty in anticipating outcomes based on textual clues and prior knowledge.

This implies that while some students can make simple guesses, forming accurate and well-supported predictions remains a developing skill. Prediction-making is a key component of active reading, as it enables learners to think ahead and remain engaged with the text. As emphasized in reading comprehension research, predictive thinking supports deeper comprehension by maintaining active engagement (Oakhill et al., 2021).

Table 5

*Frequency Distribution of Higher Order Comprehension Skill in terms of Making Predictions*

Score Range	Interpretation	Frequency	Percentage
6.01 – 7.00	Outstanding	0	0.00
5.01 – 6.00	Very Good	6	2.71
4.00 – 5.00	Average	57	25.79
2.00 – 3.00	Fair	124	56.11
1.00 – 1.99	Poor	34	15.38
<b>Total</b>		<b>221</b>	<b>100</b>
<b>Mean</b>		<b>2.74</b>	
<b>Interpretation</b>		<b>Fair</b>	
<b>SD</b>		<b>1.31</b>	

The distribution further showed that 56.11% of students were in the Fair category, followed by 25.79% in the Average level, while only 2.71% reached the Very Good level and none attained the Outstanding level. Additionally, 15.38% were classified under the Poor category. This pattern indicates that strong prediction skills are not yet widely developed among students. According to Yamashita et al. (2023) limited predictive ability may affect learners' engagement with texts, as difficulty in anticipating outcomes can reduce active processing during reading.

The relatively low performance may also suggest challenges in recognizing textual cues and connecting ideas to anticipate possible developments. Developing prediction skills requires integrating background knowledge with textual understanding and logical reasoning. According to Greenleaf et al. (2023), prediction-making strengthens comprehension by encouraging readers to think critically and evaluate unfolding information. This strategy helps learners actively process texts and construct deeper meaning. The standard deviation (SD = 1.31) reflects variability in students' abilities, indicating the need for guided support to strengthen this skill.

Overall, the findings suggest that prediction-making remains an emerging higher-order comprehension skill among students, highlighting the importance of structured instruction and guided practice to support its development.

#### 4.3 Drawing Conclusions

The results showed that students' ability in *drawing conclusions* obtained a mean of 4.07, interpreted as Good, indicating that learners are generally capable of synthesizing information and forming logical interpretations based on textual evidence. This suggests that many students can recognize key details and relate them to develop meaningful understanding. Drawing conclusions is an essential component of higher-order comprehension, as it requires readers to move beyond literal meaning toward interpretation. Palincsar & Brown (1984) showed that prediction and other reciprocal teaching strategies help readers connect clues and interpret meanings, thereby achieving deeper comprehension. Building on this foundation, Pressley et al. (2023) argue that balanced reading instruction combines these strategies with skill development to foster effective literacy learning.

Table 6

*Frequency Distribution of Higher Order Comprehension Skill in terms of Drawing Conclusions*

Score Range	Interpretation	Frequency	Percentage
6.01 – 7.00	Outstanding	10	4.52
5.01 – 6.00	Very Good	28	12.67
4.00 – 5.00	Average	110	49.77
2.00 – 3.00	Fair	53	23.98
1.00 – 1.99	Poor	20	9.05

<b>Total</b>	<b>221</b>	<b>100</b>
<b>Mean</b>	<b>4.07</b>	
<b>Interpretation</b>	<b>Good</b>	
<b>SD</b>	<b>1.68</b>	

The distribution revealed that 49.77% of students performed at the Average level, while 12.67% reached the Very Good level and 4.52% attained the Outstanding level. However, 23.98% fell under the Fair category and 9.05% under Poor. This pattern indicates that although most students demonstrate the ability to draw reasonable conclusions, consistent high-level performance is still developing. As noted by Kim (2023), drawing conclusions requires both literal understanding and inferential reasoning, which explains the variability in performance across learners.

The relatively strong representation in the Average and Very Good categories suggests that many students possess a developing capacity to analyze relationships, identify central ideas, and interpret textual meaning. Bean & Melzer (2021) emphasized that drawing conclusions reflects active reading, as learners integrate multiple pieces of information to form understanding.

However, the presence of students in the Fair and Poor categories highlights the need for continued support. Some learners may still struggle to connect ideas or evaluate the significance of details. According to Dunn (2021), students improve in this skill when guided to examine evidence and consider the author's message critically.

Overall, the findings indicate that drawing conclusions is a developing higher-order comprehension skill among students, with performance varying across levels, as reflected by the standard deviation (SD = 1.68).

Table 7

*Summary Table of the Higher Order Comprehension Skills*

Comprehension Skill	Mean Score	Interpretation	SD
Drawing Conclusions	4.07	Good	1.68
Making Predictions	2.74	Fair	1.31
Making Inferences	4.87	Good	2.08
Overall Skill	3.89	Good	1.69

Table 7 summarizes the students' higher-order comprehension skills. *Making Inferences* and *Overall Skill* achieved the highest mean scores (4.87, Good), indicating that students are generally capable of interpreting implied meanings and engaging in analytical reasoning. *Drawing Conclusions* followed with a mean of 4.07 (Good), suggesting that learners can synthesize information and form logical interpretations, though nearly half performed at the Average level, reflecting room for improvement. In contrast, *Making Predictions* obtained the lowest mean (2.74, Fair), highlighting ongoing difficulties in anticipating textual outcomes. The standard deviations (1.31–2.08) indicate variability in student performance across all skills.

Overall, the findings suggest that while students demonstrate strong inferential abilities, predictive comprehension remains an area needing targeted support to strengthen their higher-order reading skills.

##### 5. Significant relationships between motivation to read, quality of reading instruction, utilization of assistive technology, and higher-order comprehension skill

Table 8 presented the canonical correlation analysis between the quality of reading instruction and higher-order comprehension skills. The analysis revealed a weak but significant correlation,  $R = 0.191$ ,  $R^2 = 0.036$ ,  $F(3, 217) = 2.736$ ,  $p = 0.045$ , indicating that reading instruction contributed to higher-order comprehension, although it was not the sole factor influencing students' understanding.

Table 8

*Canonical Correlation Analysis Between Quality of Reading Instruction and Higher Order Comprehension*

Variable	Cross loading	R	R <sup>2</sup>	F(3, 217)	P
Quality of Reading Instruction	0.19			2.736*	

Higher Order Comprehension Skills		0.19	0.03	0.04
Drawing Conclusion	0.14	1	6	5
Making Inferences	0.18			
Making Predictions	0.08			

\*Significant at 0.05 two-tailed alpha level.

The cross-loading values showed that Making Inferences had the highest loading (0.18), followed by Drawing Conclusions (0.14) and Making Predictions (0.08), suggesting that inference-making benefited most from effective instruction, particularly when teachers explicitly modeled strategies and guided students through textual clues. This aligns with Rice et al. (2023), who noted that students develop inference skills by connecting details, prior knowledge, and logical reasoning. The lower loadings for Drawing Conclusions and Making Predictions indicated that students required additional support in these areas, consistent with Brod (2021), who emphasized that prediction skills improve when learners are guided to anticipate outcomes, justify their reasoning, and revise predictions while reading.

Overall, the findings confirmed that the quality of reading instruction played a significant, though limited, role in shaping Grade 7 students' higher-order comprehension skills. The strongest association in inference-making highlighted the importance of strategy modeling and guided thinking during reading tasks. Although correlations were weak, their statistical significance warranted rejection of the second null hypothesis, affirming that instructional quality contributed meaningfully to comprehension development. These results underscored the value of evidence-based instruction in fostering deeper understanding, critical thinking, and confident engagement with texts.

Table 9

*Canonical Correlation Analysis Between Motivation to Read and Higher Order Comprehension*

Variable	Cross loading	R	R <sup>2</sup>	F(3, 217)	P
Motivation to Read	0.09				
Higher Order Comprehension Skills		0.089	0.008	0.572	0.634
Drawing Conclusion	0.04				
Making Inferences	0.05				
Making Predictions	-0.06				

\*Significant at 0.05 two-tailed alpha level.

Table 9 presented the canonical correlation analysis between motivation to read and students' higher-order comprehension skills. The results *showed* no significant relationship,  $F(3, 217) = 0.572$ ,  $p = 0.634$ ,  $r = 0.089$ , with only 0.8% of variance explained, confirming the first null hypothesis. Cross-loading values were minimal, with Making Inferences at 0.05, Drawing Conclusions at 0.04, and Making Predictions at -0.06, indicating that motivation had little to no connection to specific higher-order comprehension skills.

These findings suggested that while motivation may encourage reading engagement, it did not directly enhance students' ability to infer, predict, or draw conclusions. Higher-order comprehension required explicit strategy instruction, vocabulary development, and guided practice, consistent with Ryskin & Nieuwland (2023), who emphasized that motivation alone supports engagement but not deeper cognitive processing.

Table 10

*Canonical Correlation Analysis Between Utilization of Assistive Technology and Higher Order Comprehension*

Variable	Cross loading	R	R <sup>2</sup>	F(3, 217)	P
Utilization of Assistive Technology	0.14				
Higher Order Comprehension Skills		0.135	0.018	1.353	0.258
Drawing Conclusion	-0.09				
Making Inferences	-0.07				
Making Predictions	-0.13				

Table 10 presented the canonical correlation analysis between assistive technology use and students' higher-order comprehension skills. Results showed no significant relationship,  $F(3, 217) = 1.353$ ,  $p = 0.258$ ,  $r = 0.135$ , with only 1.8% of variance explained, confirming the third null hypothesis. Across all variables, the quality of reading



instruction showed a weak but significant positive association with higher-order comprehension ( $r = 0.191$ ,  $p = 0.045$ ). Making inferences had the strongest cross-loading (0.18), further supporting the importance of guided strategy instruction (Rice et al., 2023; Gallagher, 2023). Motivation ( $r = 0.089$ ,  $p = 0.634$ ) and assistive technology ( $r = 0.135$ ,  $p = 0.258$ ) were not significantly related, with cross-loadings near zero or negative.

Overall, the findings indicate that higher-order comprehension among Grade 7 students depends largely on the quality of instructional practices implemented in the classroom. Explicit strategy instruction, guided reading activities, and opportunities for discussion enable learners to engage deeply with texts and develop analytical reading skills. While reading motivation and assistive technology may support engagement, these factors alone do not guarantee the development of higher-order comprehension. For teachers and curriculum developers, the results highlight the need to integrate structured comprehension strategies—particularly prediction, inference, and conclusion-making—within reading instruction. Teacher education programs and school leaders may also support professional development initiatives that strengthen teachers' capacity to design strategy-based literacy instruction and integrate digital tools in ways that enhance, rather than replace, pedagogical guidance.

### Conclusion

The study concluded that Grade 7 students exhibited high motivation for reading in academically related tasks, while recreational reading habits remained underdeveloped. Students perceived reading instruction as high in quality, with clear explanations, strategy modeling, and constructive feedback, whereas the use of assistive technology was moderate and occasional. Learners performed well in making inferences and drawing conclusions but struggled with making predictions. Canonical correlation analyses showed that only the quality of reading instruction was significantly associated with higher-order comprehension skills, which emphasized the critical role of structured, strategy-based teaching. Motivation and technology use, although supportive of engagement, did not independently predict advanced comprehension, highlighting the need for instructional practices that scaffold reasoning, model comprehension strategies, and integrate predictive thinking and strategic technology use.

### Recommendations

Based on the findings and conclusions, the following recommendations are offered:

1. The institution may strengthen reading instruction by supporting teachers in providing clear explanations, strategy modeling, and constructive feedback, while providing activities that develop prediction, justification, and revision skills.
2. The institution may enhance student engagement by encouraging teachers to facilitate questioning, idea-sharing, and discussion of multiple interpretations through think-pair-share, small-group, and whole-class activities.
3. The institution may integrate assistive technology purposefully—such as audio support, glossaries, and multimedia texts—ensuring students use these tools to infer, predict, and draw conclusions for deeper comprehension.
4. The institution may promote voluntary reading through choice reading, book talks, reading journals, and personal-interest projects to foster self-directed reading habits.
5. Curriculum planners may align reading materials and activities across subjects to consistently develop inference, prediction, and conclusion-making skills.
6. Reading coordinators may use assessment results to design tiered interventions and provide structured support for learners who struggle with making prediction and drawing conclusion.
7. Future researchers may examine additional factors affecting higher-order comprehension, evaluate instructional strategies to improve prediction skills, and explore the combined effect of assistive technology and strategy instruction on deeper comprehension.
8. Students may actively apply reading strategies by highlighting details, asking questions, making predictions, using assistive tools for understanding, and engaging in voluntary reading to strengthen comprehension and confidence.

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