



MULTIDIMENSIONAL ASSESSMENT MODEL OF COGNITIVE, LINGUISTIC, AND ENVIRONMENTAL FACTORS ON READING COMPREHENSION DIFFICULTIES AMONG GRADE 6 LEARNERS

Renilyn D. Reola

*Graduate Studies, Mindoro State University, Alcate, Victoria,
Oriental Mindoro, Philippines*

ABSTRACT

Reading comprehension difficulties among elementary learners continue to pose a significant challenge in achieving literacy outcomes, particularly in developing educational contexts such as the Philippines. This study examined the predictive contribution of cognitive, linguistic, and environmental factors on reading comprehension difficulties among 160 Grade 6 learners in Victoria District. The study is important as it provides empirical evidence on the multidimensional nature of reading difficulties and supports data-driven interventions aligned with national literacy initiatives such as the Phil-IRI and the “No Read, No Pass” policy. A predictive-correlational research design was employed, utilizing multiple regression analysis and structural equation modeling to determine the relationships among variables. Data were gathered using standardized and researcher-adapted instruments measuring cognitive, linguistic, environmental factors, and reading comprehension difficulties. Findings revealed that learners experienced greater difficulty in higher-order cognitive and linguistic processes, particularly in inference-making, vocabulary knowledge, working memory, and grammar and syntax skills, while fluency showed comparatively lower difficulty levels. Regression analysis showed that the model was statistically significant, explaining 30.9 percent of the variance in reading comprehension difficulties. Cognitive factors, particularly working memory, processing speed, and inference skills, along with linguistic factors such as grammar and syntax and phonological awareness, were significant predictors, while environmental factors did not show significant unique contributions in the combined model. Structural equation modeling results supported these findings, indicating stronger pathways from cognitive-linguistic factors to reading comprehension difficulties compared to environmental factors. The study contributes to the literature by providing localized

empirical evidence on the dominance of cognitive and linguistic predictors in reading comprehension difficulties among Grade 6 learners, addressing a gap in Philippine-based predictive modeling studies. These findings suggest the need to strengthen learners' cognitive processing and language skills through targeted instructional strategies and intervention programs to improve reading comprehension performance.

Keywords: *reading comprehension difficulties, cognitive factors, linguistic factors, environmental factors, Grade 6 learners*

INTRODUCTION

Reading comprehension is a foundational academic skill that underpins learning across all subject areas and is widely recognized as a strong predictor of lifelong educational success. Despite its central role in academic achievement, a significant proportion of learners worldwide continue to experience persistent difficulties in understanding written texts. This remains a major concern across education systems globally, as evidenced by large-scale assessments indicating that many students fail to reach minimum proficiency levels in reading (World Bank, 2022; UNESCO, 2022).

At the global level, reading comprehension difficulties are not limited to low-performing systems but are also observed in high-performing countries. Reports from the OECD (2023) and Our World in Data (2024) indicate that even learners in advanced education systems struggle to meet expected literacy standards. This suggests that reading comprehension challenges are not solely a matter of access to education but are also influenced by complex cognitive, linguistic, and environmental factors.

The issue is more pronounced in developing regions such as Sub-Saharan Africa, South Asia, Southeast Asia, and Latin America, where learning poverty rates remain alarmingly high, often exceeding 70–80% despite increased school enrollment (World Bank, 2025). Contributing factors include limited access to reading materials, overcrowded classrooms, language mismatches between home and school, and insufficient literacy support systems. The COVID-19 pandemic further intensified these challenges by disrupting learning continuity and widening pre-existing educational inequalities (UNESCO, 2022).

In the Philippine context, reading comprehension difficulties mirror these global concerns. National assessments, particularly the Philippine Informal Reading Inventory (Phil-IRI), consistently reveal that a substantial number of learners are below expected reading proficiency levels (Gasis, 2025). Many Grade 6 learners fall under the frustration level, indicating severe difficulty in understanding grade-level texts (Enomar & Fernal, 2025; Miñoza & Montero, 2019). Despite national interventions such as the “No Read, No Pass” policy and the integration of literacy competencies under the Most Essential Learning Competencies (MELCs), reading difficulties remain widespread (DepEd NCR Memorandum No. 78, s. 2018; DepEd, 2020).

National education policies strongly support this issue. DepEd Order No. 14, s. 2018 institutionalized the Phil-IRI as a standardized assessment tool for diagnosing reading levels, while DepEd Order No. 31, s. 2019 emphasized literacy as a core competency in basic education. These policies highlight the importance of early identification and targeted intervention for struggling readers.

At the local level, the Victoria District reflects similar patterns. Phil-IRI Group Screening Test results indicate that approximately 70–85% of Grade 6 learners are performing below expected reading proficiency levels (Victoria District, 2025). This high prevalence of frustration-level readers emphasized the need to further examine the relationships among factors associated with reading comprehension difficulties in the local educational context.

To better understand the factors associated with reading comprehension difficulties, it is important to examine the existing literature on the cognitive, linguistic, and environmental dimensions of reading comprehension. The Simple View of Reading (SVR) proposes that reading comprehension is the product of decoding and linguistic comprehension (Nation, 2019). Although this framework remains influential, recent studies suggest that it does not fully capture the role of higher-order cognitive processes in reading performance. Empirical findings show that working memory, attention control, processing speed, and executive functions are associated with reading comprehension performance because they support learners' ability to hold, manage, and integrate textual information during reading (Peng et al., 2019; Rakesh et al., 2024). Similarly, executive functions such as cognitive flexibility and inhibitory control influence reading through attention regulation and strategic processing (Reina-Reina et al., 2024). Meta-analytic evidence further identifies vocabulary knowledge, decoding efficiency, and listening comprehension as consistent predictors of reading comprehension across developmental stages (Nilsson et al., 2025). In addition, Vettori et al. (2023) found that cognitive and linguistic variables operate in interrelated patterns rather than independently. Despite these findings, cognitive variables are often examined in isolation, limiting understanding of their interaction with linguistic and environmental factors.

Beyond cognitive processes, linguistic competence is strongly associated with reading comprehension performance. Vocabulary depth and syntactic knowledge consistently show significant associations with comprehension outcomes, particularly in inferential and expository reading tasks (Rogde et al., 2019). Likewise, variations in vocabulary, grammar, and discourse processing are associated with differences in comprehension levels (Adlof & Hogan, 2018; Catts, 2021). Catts (2021) emphasized that reading comprehension should be understood as an interaction among linguistic knowledge, cognitive processing, and contextual influences rather than a decoding-only outcome. Moreover, phonological awareness is linked to early literacy development and later comprehension performance (Fernández-Otoya et al., 2022). However, intervention findings vary due to differences in instructional implementation, learner engagement, and contextual conditions (Lagdaan & Sevilla, 2025).

In addition to cognitive and linguistic influences, environmental factors are consistently associated with reading development outcomes. The home literacy environment, classroom practices, peer interactions, and socioeconomic status shape literacy exposure and engagement. Studies show that enriched home literacy environments, including shared reading and exposure to print materials, support stronger early literacy development (Niklas et al., 2021). However, socioeconomic conditions, parental education, and access to literacy resources influence these relationships differently. Socioeconomic status is consistently associated with reading performance, with learners from low-income contexts often experiencing limited access to language-rich learning environments (Black, 2025). Similarly, parental involvement and school-home collaboration are associated with improved literacy outcomes, although participation is often constrained by structural barriers (School-to-School International, 2017).

These multidimensional influences are reflected in reading comprehension difficulties. The Simple View of Reading conceptualizes these difficulties as arising from variations in decoding and linguistic comprehension (Hoover, 2024). However, evidence shows that reading comprehension profiles are heterogeneous. Some learners demonstrate adequate decoding but weak comprehension due to limited oral language skills such as vocabulary and listening comprehension (Guo et al., 2022). Other studies show variation across assessment formats, indicating that comprehension involves multiple interacting skill domains (Collins et al., 2018). Common correlates of lower comprehension include limited vocabulary, reduced engagement, and weaker fluency skills (Damayanti et al., 2025).

Taken together, the literature indicates that reading comprehension difficulties are associated with cognitive, linguistic, and environmental factors. Cognitive skills such as working memory, attention, processing speed, and inference skills, linguistic abilities such as vocabulary knowledge, grammar and syntax, phonological awareness, and reading fluency, as well as environmental conditions including home literacy environment, classroom environment, peer influence, and socioeconomic status, are all associated with learners' reading comprehension. However, most previous studies have examined these factors independently, resulting in fragmented explanations of reading comprehension difficulties. Moreover, although assessments such as the Philippine Informal Reading Inventory (Phil-IRI) effectively identify learners' reading proficiency levels, they do not explain the cognitive, linguistic, and environmental factors associated with these difficulties. Likewise, limited studies have simultaneously examined these variables within a single explanatory framework using Structural Equation Modeling (SEM), particularly among Grade 6 learners in Philippine public elementary schools. This conceptual and methodological gap highlights the need for a multidimensional model that examines the relationships among cognitive, linguistic, and environmental factors and reading comprehension difficulties. Accordingly, this study examined the relationships among cognitive, linguistic, and environmental factors and reading comprehension difficulties among Grade 6 learners in participating public elementary schools in Victoria District. Specifically, the study employed Structural Equation Modeling (SEM) to identify the best-

fitting model explaining the relationships among cognitive, linguistic, and environmental factors and reading comprehension difficulties among Grade 6 learners.

Research Questions

This study aimed to examine the relationships among cognitive, linguistic, and environmental factors and reading comprehension difficulties among Grade 6 learners in participating schools within Victoria District. Specifically, it sought to answer the following questions:

1. What is the level of cognitive factors of Grade 6 learners in terms of:
 - 1.1. working memory,
 - 1.2. attention span,
 - 1.3. processing speed, and
 - 1.4. inference skills?
2. What are the levels of linguistic factors of Grade 6 learners in terms of:
 - 2.1. vocabulary knowledge,
 - 2.2. grammar and syntax skills,
 - 2.3. phonological awareness, and
 - 2.4. reading fluency?
3. What are the levels of environmental factors of Grade 6 learners in terms of:
 - 3.1. home literacy environment,
 - 3.2. classroom environment,
 - 3.3. peer influence, and
 - 3.4. socioeconomic status?
4. What is the extent of reading comprehension difficulties experienced by Grade 6 learners in Victoria District as identified through the Phil-IRI Group Screening Test (GST) in terms of:
 - 4.1 difficulty in understanding texts,
 - 4.2 difficulty in making inferences,
 - 4.3 struggles in identifying main ideas and details, and
 - 4.4. weak interpretive reading skills?
5. To what extent do cognitive factors predict the reading comprehension difficulties of Grade 6 learners?
6. To what extent do linguistic factors predict the reading comprehension difficulties among Grade 6 learners?
7. To what extent do environmental factors predict the reading comprehension difficulties among Grade 6 learners?
8. Is there a significant combined relationship among cognitive, linguistic, and environmental factors and the reading comprehension difficulties among Grade 6 learners?
9. Based on the results, which of the Structural Equation Models (SEM) best fits to explain the relationship of the cognitive, linguistic, and environmental factors to the reading comprehension difficulties among Grade 6 learners?

METHODOLOGY

Research Design

A predictive correlational research design within the quantitative, non-experimental approach was employed in this study. In correlational quantitative design, relationships among variables were described and predictions were made without manipulation of any variable. It quantified relationships in terms of strength, direction, and significance using statistical methods such as correlation and regression.

As emphasized by Creswell and Creswell (2023), the primary purpose of correlational design is to assess the strength and direction of association among two or more variables. In predictive correlational studies, variables are identified as independent (predictor) or dependent (outcome or criterion) variables and are used to determine how much variance in the outcome variable is predicted by one or more predictor variables.

In this study, the predictive correlational design was appropriate as it determined the extent to which cognitive, linguistic, and environmental factors were associated with reading comprehension difficulties among learners. Since the study did not involve manipulation of variables but focused on identifying relationships among predictors and outcomes, this design provided a systematic, rigorous, and methodologically sound framework, consistent with current quantitative research standards.

Research Locale

The study was carried out in the Schools Division of Oriental Mindoro, Municipality of Victoria, First District. The chosen research location included selected public elementary schools in the first district. The area provided an appropriate setting for investigating factors related to reading comprehension difficulties, as it consists of learners with diverse profiles and access to various educational resources typical of a public-school setting in the province.

Respondents of the Study

The participants of this study were Grade 6 learners from chosen public elementary schools within the Victoria District during School Year 2025–2026. These learners were chosen using the Phil-IRI Group Screening Test (GST) and were determined to be in the frustration level of reading comprehension. Based on Phil-IRI Group Screening Test (GST) results, a total of 356 learners aged 11 to 13 years old (199 males and 169 females) were identified as being at the frustration level, indicating serious reading comprehension difficulties. From this population, a stratified random sample of 160 learners was selected, with 20 learners per school from eight public elementary schools. The stratification process was performed on the basis of school and gender to ensure proportional representation.

Sampling Technique

Stratified random sampling with proportional allocation was employed to obtain an adequate sample size of Grade 6 learners that would be used during the test. All eight public elementary schools in the Victoria District served as the sampling frame. Of the 368 Grade 6 learners identified as being at the frustration level based on the Phil-IRI Group Screening Test, twenty (20) learners from each school were selected to participate in the study, resulting in a total of 160 participants.

Random selection within each school stratum was done separately for male and female learners to conserve the school-level sex distribution. Minor rounding adjustments were made to attain the target number per school. In cases where a school had fewer than 20 learners, all available learners were included.

Research Instruments

A modified set of instruments was employed in this study to gather data regarding the cognitive, linguistic, environmental factors, and reading comprehension difficulties among Grade 6 learners. The research instruments used have been modified from existing standardized measures and made culturally relevant in light of the Philippine curriculum, Phil-IRI, and the Grade 6 competencies in English. Among the adaptation processes were changing the items, using local examples, and having the experts validate the instruments so that they are culturally appropriate and relevant.

Cognitive Factors

Among the cognitive factors measured were working memory, attention span, processing speed, and inferring.

Reading Span Task was used as a basis for assessing working memory, where the learners listened to several short sentences and wrote down the last word of each sentence. The task consisted of three sets: two sentences, three sentences, and five sentences. Scores were based on the number of correctly recalled final words.

Attention span was assessed using a classroom observation checklist with ten items that were modified from Barkley (1997). Teachers evaluated the learners while they engaged in reading activities according to their attention, perseverance in tasks, fidgeting, and attention strategies on a scale of one to five.

Processing speed was determined using a timed reading task with ten items where the learners had to determine the main idea and support details in ten minutes.

Inference skills were evaluated using two reading passages with multiple-choice questions requiring learners to infer meanings, predict outcomes, and interpret implicit relationships beyond explicitly stated information. Although the passages were used as the assessment tool, the construct measured was distinct from general reading

comprehension, as it specifically focused on the learners' ability to think critically and reason beyond the given text.

Linguistic Factors

In relation to the linguistic factors, the areas to be covered are the vocabulary, grammar, syntax, phonological awareness, and fluency.

Vocabulary knowledge was tested using a 10-item multiple-choice test embedded into two reading passages, adapted from the most recent learning materials. In this test, learners will pick the definition of the target words that best fits the context.

Grammar and syntax skills were measured through a 10-item multiple-choice test with sentence completion, error identification, punctuation, verb tense, voice, and subject-verb agreement as the categories of questions.

Phonological awareness was assessed from a 10-item segmentation and blending task that was adapted from Yopp (1988), where learners first segment words into individual phonemes and later blend them to get the original word.

Fluency was determined by a one-minute Oral Reading Fluency (ORF) test that is in line with Phil-IRI standards, in which learners read grade-level passages aloud and teachers note the Words Correct Per Minute (WCPM) and types of miscues, such as mispronunciations, omissions, and substitutions.

Environmental Factors

As for the environmental factors, home literacy, classroom support, peer influence, and socioeconomic status were measured.

To assess the home literacy environment, a nine-question survey for learners, adapted from Burgess et al. (2002), was used in which the availability of reading materials, shared reading, and literacy support was assessed, and the answers rated on a five-point frequency scale.

Classroom support was evaluated through a 12-item questionnaire adapted from Pianta & Hamre (2009), where the questions covered teacher guidance, reading materials, classroom arrangement, and individualized support, and learners indicated the frequency of each item.

Peer influence was evaluated through the responses of learners to the nine-item questionnaire adapted from Wentzel (1998). The items of the questionnaire focused on the areas of encouragement, collaborative reading, and class discussion and the respondents rated them on a four-point scale.

Socioeconomic status was determined through a five-item survey adapted from OECD (2019), covering parental education and access to home learning resources such as devices, internet connection, and a quiet study space.

Reading Comprehension Difficulties

Reading comprehension difficulties were determined through a test composed of twenty multiple-choice questions based on the Phil-IRI model (DepEd, 2018).

The test included literal comprehension (7 items), inferential comprehension (4 items), main idea and detail identification (4 items), and interpretive reading (5 items). This tool served as a thorough measure of learners' difficulties in understanding, interpreting, and analyzing texts.

Scores were based on the number of correct responses across all domains.

Data Gathering Procedure

Ethical clearance was obtained from the University Research Ethics Review Committee, and permission was secured from the Schools Division Office of Oriental Mindoro. After approval, coordination with school heads and teachers was conducted for scheduling. Consent forms were distributed to parents, and assent was obtained from learners. Data collection was carried out in batches over four weeks to minimize disruption to classes. Instruments were administered per school in a structured schedule, ensuring proper instructions and standardized administration. Completed responses were checked for completeness and encoded for analysis.

Treatment of the Data

Data were analyzed using descriptive and inferential statistics. Mean, standard deviation, and frequency distribution were used to describe the profile and performance of learners. Multiple regression analysis was employed to determine the predictive influence of cognitive, linguistic, and environmental factors on reading comprehension difficulties. The level of significance was set at 0.05 alpha.

Scope, Limitation, and Delimitation of the Study

This study focused on the examination of the cognitive, linguistic, and environmental factors that are associated with the reading comprehension difficulties of Grade 6 learners during the School Year 2025–2026. The study was conducted in Victoria District, which was selected due to its reported low reading proficiency levels based on Phil-IRI results. Available district data indicated that there were many learners who were reading significantly below the expected reading proficiency level according to the Phil-IRI Group Screening Test, thereby making this district an appropriate area of focus for the investigation of reading comprehension difficulties. All participants of the study were identified as frustration readers based on the results of the Phil-IRI Group Screening Test. This study sought to determine the relationships among cognitive, linguistic, and

environmental factors in relation to their reading comprehension difficulties. Data were collected directly from the learners using validated instruments. The study specifically examined the relationships among cognitive, linguistic, and environmental factors in relation to their reading comprehension difficulties. Data were collected directly from the learners using validated instruments.

In addition, this study was limited to learners identified as frustration-level readers. A significant limitation was the reliance on the Phil-IRI GST as the primary basis for identifying frustration-level readers; thus, the selection of participants may have been affected. The findings of the study may have limited generalizability because the participants were limited to learners with reading comprehension difficulties, excluding those who were performing at or above grade level. Furthermore, since the data will be obtained only from the learners, the answers may differ based on their understanding or interpretation of the questions, which, in turn, could affect the level and accuracy of the information obtained.

Moreover, this study was delimited to Grade 6 learners in public elementary schools who were identified as experiencing reading comprehension difficulties. It excluded learners from private schools, other grade levels, and those performing at instructional or independent reading levels. Furthermore, the study did not include variables such as reading interest, motivation, self-efficacy, or broader socio-economic indicators as primary constructs. The analysis was limited to examining the relationships between cognitive, linguistic, and environmental factors and reading comprehension difficulties. This delimitation allowed for a focused analysis of how these variables interact specifically among frustration-level readers and supported the development of targeted reading interventions for this group.

RESULTS AND DISCUSSION

1. Level of Cognitive Factors, Linguistic Factors, Environmental Factors, and Reading Comprehension Difficulties of Grade 6 Learners

Table 1

Summary of the Levels of Cognitive Factors, Linguistic Factors, Environmental Factors, and Reading Comprehension Difficulties of Grade 6 Learners

Variables	Indicator	Mean	SD	Interpretation
Cognitive Factors	Inference Skills	4.25	2.26	High difficulty
	Processing Speed	4.39	2.07	High difficulty
	Working Memory	5.20	2.67	Moderate difficulty
	Attention Span	3.50	0.58	Low difficulty
Linguistic Factors	Grammar & Syntax Skills	4.09	1.78	High difficulty
	Vocabulary Knowledge	4.33	1.85	High difficulty
	Phonological Awareness	7.74	4.38	High difficulty
	Reading Fluency	4.84	0.36	Very low difficulty

Environmental Factors	Home Literacy Environment	3.04	0.84	Moderate support
	Classroom Environment	4.14	0.58	High support
	Peer Influence	3.32	0.81	Occasional influence
Reading Comprehension Difficulties	Socioeconomic Status	4.50	0.60	Very high support
	Struggle in Identifying Main Ideas & Details	1.46	0.46	High difficulty
	Weak Interpretive Skills	1.81	0.61	High difficulty
	Difficulty in Making Inferences	2.11	0.34	High difficulty
	Difficulty in Understanding Texts	3.23	1.79	Moderate difficulty

Table 1 presented the summary of cognitive, linguistic, and environmental factors, as well as reading comprehension difficulties, among Grade 6 learners. Cognitive demands were unevenly distributed across domains, with inference skills and processing speed emerging as the most difficult areas, indicating that learners experienced greater challenges in higher-order reasoning and rapid information processing than in basic attentional control. From a Cognitive Load Theory perspective, this suggested that comprehension difficulties arise when working memory is overloaded during simultaneous decoding, integration, and interpretation of text, resulting in reduced performance in tasks requiring multi-step reasoning. In contrast, attention span showed low difficulty, while working memory showed only moderate difficulty, indicating that these factors function as supporting rather than primary constraints in performance. For linguistic factors, vocabulary knowledge, grammar, and syntax emerged as key areas of difficulty, while phonological awareness also remained high, indicating persistent challenges in both semantic and structural language processing.

However, reading fluency showed very low difficulty, suggesting strong decoding automaticity and supporting the view that fluent word reading does not necessarily guarantee reading comprehension. Environmental factors were generally rated as supportive, particularly classroom environment and socioeconomic status; however, these did not translate into strong comprehension outcomes, suggesting that environmental support alone is insufficient without corresponding cognitive and linguistic engagement. Finally, learners demonstrated greater difficulty in higher-order comprehension tasks such as identifying main ideas and making inferences, while literal comprehension was relatively stronger. These findings are consistent with the Simple View of Reading, which posits that comprehension breakdown occurs when language processing skills are weak despite adequate decoding ability.

2. Predictive Contribution of Cognitive Factors on Reading Comprehension Difficulties

Table 2
Regression Analysis on the Predictive Contribution of Cognitive Factors on Reading Comprehension Difficulties among Grade 6 learners

Cognitive Factors	B	Std. Error	T	P	Interpretation
Intercept	1.560	1.6740	0.932	.353	—
Working Memory	0.244	0.0953	2.565	.011	Significant
Attention Span	0.399	0.4657	0.857	.393	Not significant
Processing Speed	0.429	0.1287	3.334	.001	Significant
Inference Skills	0.462	0.1220	3.787	<.001	Significant
Model Summary	R = 0.465 R² = 0.216 F = 10.7 p < .001				

Table 2 showed the regression analysis of cognitive predictors of reading comprehension difficulties. The model was significant, $F(4,155) = 10.7$, $p < .001$, explaining 21.6% of the variance in reading comprehension difficulties, indicating that cognitive variables meaningfully contribute to comprehension outcomes. Among the predictors, inference skills emerged as the strongest significant variable ($B = 0.462$, $p < .001$), indicating that stronger inferential ability enhances meaning construction beyond explicitly stated text and reduces reading comprehension difficulties. Processing speed was also significant ($B = 0.429$, $p = .001$), suggesting that faster cognitive processing improves reading efficiency by reducing cognitive load. Working memory likewise showed a significant effect ($B = 0.244$, $p = .011$), reflecting its role in temporarily storing and integrating textual information during reading. In contrast, attention span was not significant ($p = .393$), indicating that it does not independently explain reading comprehension difficulties when other cognitive variables are controlled.

3. Predictive Contribution of Linguistic Factors on Reading Comprehension Difficulties

Table 3
Regression Analysis on the Predictive Contribution of Linguistic Factors on Reading Comprehension Difficulties among Grade 6 Learners

Linguistic Factors	B	Std. Error	T	P	Interpretation
Intercept	4.098	2.8713	1.427	.155	—
Vocabulary Knowledge	0.434	0.1552	2.800	.006	Significant predictor
Grammar and Syntax Skills	0.405	0.1608	2.517	.013	Significant predictor

Phonological Awareness	-0.135	0.0734	-1.837	.068	Not significant (marginal)
Fluency	0.341	0.6169	0.553	.581	Not significant
Model Summary	R = 0.347 R² = 0.120 F = 5.29, p < 0.001				

Table 3 showed that the model was statistically significant, $F(4,155) = 5.29$, $p < .001$, explaining 12% of the variance in reading comprehension difficulties, indicating a moderate contribution of linguistic skills. Vocabulary knowledge significantly predicted reading comprehension difficulties ($B = 0.434$, $p = .006$), highlighting its central role in meaning construction, as limited vocabulary restricts text understanding. Grammar and syntax skills were also significant ($B = 0.405$, $p = .013$), indicating that syntactic awareness is essential for interpreting sentence structures and relationships within texts. In contrast, phonological awareness was not significant ($p = .068$), suggesting reduced influence at higher grade levels where comprehension relies more on semantic processing, while fluency was also not significant ($p = .581$), indicating that decoding efficiency alone does not ensure comprehension when higher-order language skills are required.

4. Predictive Contribution of Environmental Factors on Reading Comprehension Difficulties

Table 4
Regression Analysis on the Predictive Contribution of Environmental Factors on Reading Comprehension Difficulties among Grade 6 learners

Environmental Factors	B	Std. Error	t	P	Interpretation
Intercept	4.781	2.638	1.812	.072	Not significant
Home Literacy Environment	0.386	0.473	0.817	.415	Not significant
Classroom Environment	-0.075	0.580	-0.130	.897	Not significant
Peer Influence	0.202	0.525	0.384	.701	Not significant
Socioeconomic Status	0.563	0.572	0.985	.326	Not Significant
Model Summary	R = 0.174 R² = 0.030 F = 1.21, p > .309				

The model was not statistically significant, $F(4,155) = 1.21$, $p = .309$, with an R^2 of 0.030, indicating that environmental factors explained only a minimal proportion of the variance in reading comprehension difficulties. None of the predictors reached statistical significance, including home literacy environment, classroom environment, peer influence, and socioeconomic status, suggesting that environmental factors alone were not significant predictors of reading comprehension difficulties. Although these factors may provide supportive learning conditions, their predictive contribution appears limited

when considered independently and may be associated with learners' cognitive and linguistic engagement. From an Ecological Systems Theory perspective, environmental conditions are understood as operating within interconnected systems that interact with learners' cognitive and linguistic development rather than serving as standalone predictors of reading comprehension difficulties.

5. Combined Relationship of Cognitive, Linguistic, and Environmental Factors to Reading Comprehension Difficulties

Table 5
Multiple Regression Results Predicting Reading Comprehension Difficulties

Predictors	B (Estimate)	SE	T	p-value	Interpretation
Intercept	-0.956	3.493	-0.274	.785	Not significant
Working Memory	0.258	0.108	2.401	.018	Significant
Attention Span	0.092	0.472	0.194	.846	Not significant
Processing Speed	0.386	0.129	2.997	.003	Significant
Inference Skills	0.377	0.123	3.062	.003	Significant
Vocabulary Knowledge	0.284	0.148	1.916	.057	Marginal (not significant)
Grammar & Syntax Skills	0.307	0.152	2.018	.045	Significant
Phonological Awareness	-0.171	0.076	-2.253	.026	Significant
Fluency	-0.198	0.620	-0.319	.750	Not significant
Home Literacy Environment	0.104	0.432	0.241	.810	Not significant
Classroom Environment	-0.234	0.520	-0.449	.654	Not significant
Peer Influence	0.822	0.473	1.736	.085	Marginal (not significant)
Socioeconomic Status	0.491	0.520	0.944	.347	Not significant
Model Summary	R = 0.556 R² = 0.309 F = 5.49 p < .001				

The combined model was statistically significant, $F(12,147) = 5.49$, $p < .001$, explaining 30.9% of the variance in reading comprehension difficulties, indicating moderate predictive power. Significant predictors included working memory, processing speed, inference skills, grammar and syntax skills, and phonological awareness, with processing speed and inference skills showing the strongest predictive relationships with reading comprehension difficulties. Vocabulary knowledge and peer influence approached significance but did not reach the conventional level of statistical significance, suggesting shared variance with other predictors and limited unique predictive contribution. Environmental variables, including home literacy environment, classroom environment, and socioeconomic status, did not demonstrate statistically significant predictive relationships with reading comprehension difficulties when examined alongside cognitive and linguistic factors. Overall, the findings indicate that cognitive and linguistic factors demonstrated stronger predictive relationships with reading comprehension

difficulties, while environmental factors showed limited predictive relationships within the combined model.

6. Structural Equation Model Fit of Cognitive, Linguistic, and Environmental Factors Predicting Reading Comprehension Difficulties among Grade 6 Learners

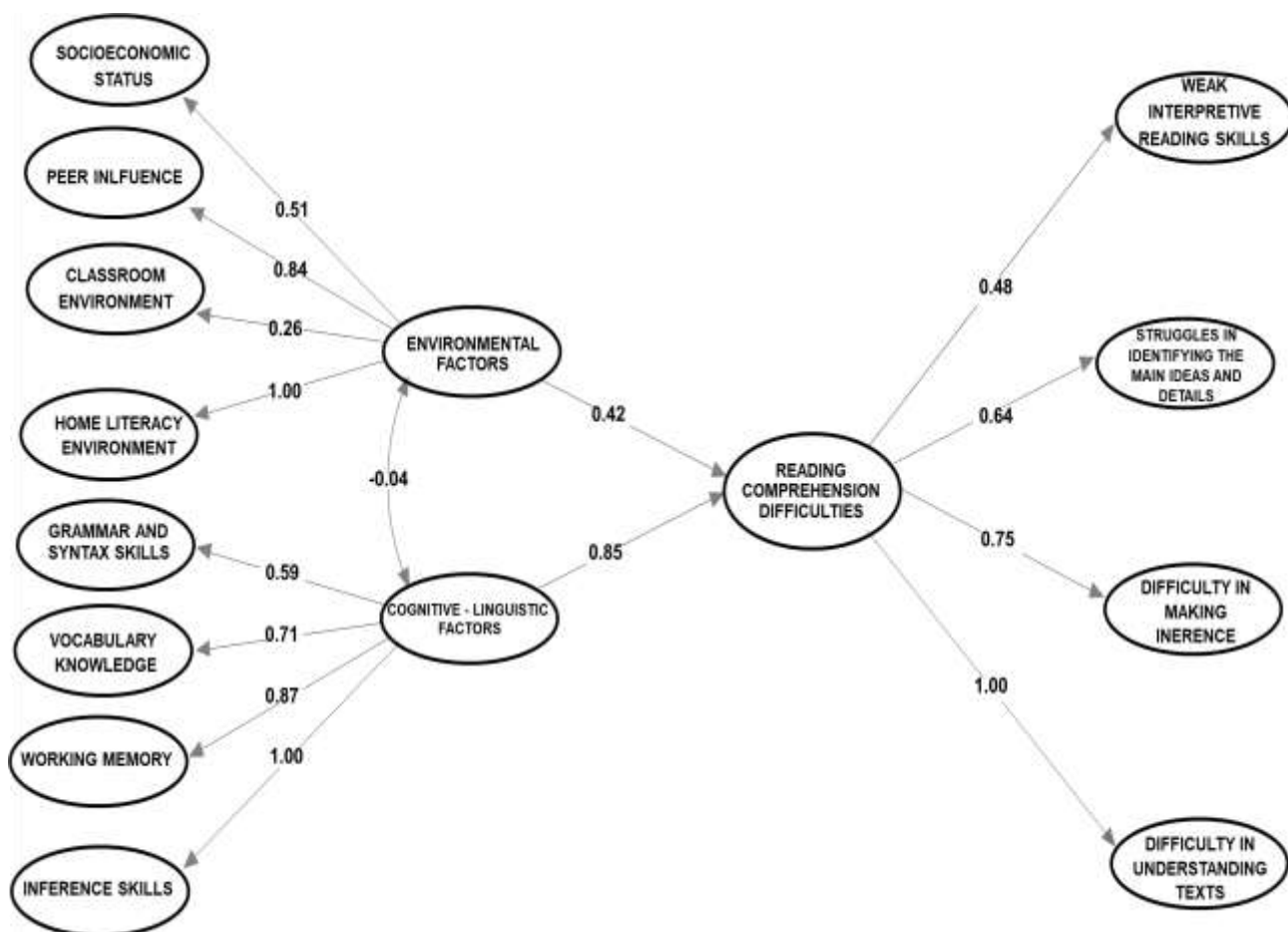


Figure 2. Structural Model of the Relationships among Environmental, Cognitive-Linguistic, and Reading Comprehension Difficulty Variables

Figure 2 showed the structural model of cognitive-linguistic factors, environmental factors, and reading comprehension difficulties. The model demonstrated good fit ($\chi^2(51) = 65.5$, $p = .084$, CFI = .957, TLI = .944, RMSEA = .042, SRMR = .051), indicating that the proposed structure adequately represented the observed data. The model further showed that cognitive-linguistic factors had a stronger relationship with reading comprehension difficulties ($\beta = 0.85$) compared to environmental factors ($\beta = 0.42$), suggesting that cognitive and linguistic variables demonstrated stronger associations with reading comprehension difficulties than environmental variables within the model. These findings support the Simple View of Reading and Cognitive Load Theory, highlighting the

significant relationships of working memory, inference skills, and vocabulary with reading comprehension outcomes, while environmental factors showed comparatively weaker relationships. In conclusion, the SEM findings indicate that cognitive-linguistic factors demonstrated stronger relationships with reading comprehension difficulties, whereas environmental factors showed a weaker relationship within the proposed model.

Conclusions

Based on the findings the following conclusions were drawn:

1. Grade 6 learners experienced high levels of difficulty in cognitive processes related to higher-order thinking.
2. Linguistic factors, particularly, vocabulary knowledge, grammar and syntax skills in this aspect significantly predicted reading comprehension difficulties in Grade 6 learners and outweighed those of phonological processing skills and fluency.
3. Environmental factors were not found to have great impact on reading comprehension difficulties, though they play a supporting role through being exposure to texts read and immersion in the context through this.
4. Grade 6 learners experienced much difficulties in their reading comprehension, and what have been identified is that these difficulties were primarily about higher-order processing skills like making inference, stating main ideas and details, and interpretive reading, and they had more difficulty in higher-order thinking than simply reading literally.
5. Cognitive factors such as inference skills and processing speed, were significant predictors of reading comprehension difficulties, which clearly highlights how it is necessary to process rapidly and meaningfully the information so as to infer information beyond the stated information in the text.
6. Linguistic factors significantly predicted reading comprehension difficulties, with vocabulary, grammar, and syntax as the strongest contributors, indicating that language proficiency plays a more important role than phonological awareness or fluency at this level, although the effect was modest.
7. Environmental factors did not significantly predict reading comprehension difficulties, indicating a minimal direct effect in this model.
8. Reading comprehension difficulties were mainly explained by cognitive factors such as working memory, processing speed, and inference skills and linguistic factors such as vocabulary knowledge and grammar and syntax skills, indicating that comprehension is largely an internal process driven by cognitive and language abilities.
9. The final Structural Equation Model (SEM) was identified as the best-fitting model for explaining the relationships among cognitive, linguistic, and environmental factors and reading comprehension difficulties among Grade 6 learners. When all factors were considered together, cognitive and linguistic processes showed the strongest contribution

to reading comprehension difficulties, suggesting that comprehension is more closely linked to learners' thinking skills and language ability, while environmental factors played a smaller, supporting role.

Recommendations

Based on the findings and conclusions drawn from the collected data, the researcher recommends the following:

1. Teachers may implement strategies that develop learners' working memory, processing speed, and inference skills through guided and scaffolded reading activities.
2. Teachers may strengthen instruction in vocabulary and grammar and syntax through contextualized and structured language activities to improve learners' linguistic competence.
3. School administrators, teachers, and parents may strengthen home–school reading support and literacy-rich environments to sustain learners' reading exposure and engagement despite environmental factors registering only a low level of difficulty.
4. The teachers may develop some reading activities that focus on higher-order reading comprehension processing, such as identifying the main idea, making inferences, and interpreting text, and incorporate them into daily reading instructions for addressing the identified reading comprehension difficulties of learners.
5. Teachers may use timed reading and reading comprehension tasks with a focus on inference to boost the readers' fluency and language comprehension.
6. Teachers may foster learners' language skills by ensuring a rich print environment, designing language-rich interactions with readers, and giving explicit opportunities for learners to utilize their vocabulary, grammar, and sentence structure meaningfully.
7. Teachers, parents, and school administrators may strengthen the home-school partnership of the learners to encourage the learners' reading participation through their parental involvement, family reading, and family reading habit, which would act as reinforcing conditions.
8. The teachers and the school system may prioritize those programs that will target the higher-order cognitive and linguistic skills as major causes that affect reading comprehension.
9. The Department of Education may implement the data-based reading programs by focusing on the readers' cognitive and language skills with environmental support to strengthen learners' reading comprehension.
10. Future researchers may replicate and expand this study by including additional variables and further examining mediation and moderation effects using structural equation modeling to provide a deeper understanding of reading comprehension difficulties.

Compliance with Ethical Standards

The researcher closely adhered to the ethical guidelines all through the research and at the same time made sure that the minor learners' rights, protection, and welfare were safeguarded, as these learners were the participants of the study and were also identified as struggling readers. The study met the ethical standards and requirements of the University Research Ethics Review Committee (URERC). After the research proposal had been submitted for ethical review, the researcher made the necessary revisions and adjustments based on the recommendations to ensure that all procedures complied with the recognized ethical guidelines for research involving human participants. Before the start of data gathering, the parents or guardians of Grade 6 learners who were selected were thoroughly informed about the goals, methods, and advantages of the research study. A written consent form was also handed out that plainly explained that taking part in their child's participation was voluntary, participants had the right to withdraw at any given time with no repercussions, and that all participants' answers would be kept confidential.

Letters of assent with a suitable language were given to the learners, and they were instructed about the study in a way that they were comfortable to participate, can reject, or even skip any questions they were uneasy with. The researcher has been able to make sure that both learners and parents feel free to withdraw their consent or refuse to participate at any time without repercussions. The principle of voluntary participation without force was followed which enables respect for the participants' freedom and comfort. Additionally, the researcher ensured that identities and research participation were confidential and anonymous. All personal information collected from the respondents was handled in accordance with the provisions of the Data Privacy Act of 2012 (Republic Act No. 10173). Respondents' identities, questionnaire responses, and other sensitive information were securely stored, protected, and accessed only by the researcher. Research data were analyzed in a way that no identified participant name or information were use or presented. The hard copy files such as consent forms and instruments were only known to the researcher who secured them in a locked drawer. After the completion of the research, the data were securely disposed.

The researcher also ensured participants' safety by identifying and minimizing any potential risks during the conduct of the study. Learners were required to take tests and complete the questionnaires in a safe and comfortable environment without being taken out of their regular academic schedule. They were given guidance and help, and if any learner found it difficult or uncomfortable, either physically, psychologically, or emotionally, support was provided. The research was centered on the learners' safety and not on their consent alone. For the researcher, the highest priority was professionalism and respect, as they are the fundamental values that guided interactions with all stakeholders, including learners, parents, school staff, and authorities. Communication was always being honest and respectful, and the researcher always responded to the questions, clarifications, or concerns of the participants or their parents in a timely and appropriate manner. The researcher secured all necessary written permits and approvals before the commencement of data gathering. This ensured that all research procedures complied

with the institutional, ethical, and legal requirements applicable to the study setting and the community involved.

Finally, the researcher conducted the study in a transparent and open way. The researcher elaborated clearly on the objective of the study, methodology, and application of the results obtained without distorting anything. Through observing high ethical standards, the researcher conducted the study in a responsible manner, with high social and ethical integrity. This enabled the protection of participants' rights, well-being, and safety while at the same time conducting research in an ethical and credible way. The researcher declares that this manuscript is an original work and was prepared solely by the researcher. No artificial intelligence (AI) tools were used in generating the content, analyzing the data, interpreting the findings, or writing the manuscript. To uphold academic integrity, the manuscript was subjected to similarity checking using Turnitin, and all borrowed ideas, concepts, and sources were properly acknowledged and cited in accordance with accepted academic and ethical standards.

Furthermore, the researcher declares that no conflict of interest existed throughout the conduct of the study. The collection, analysis, interpretation, and presentation of the data were carried out objectively, honestly, and without bias to ensure the credibility and trustworthiness of the findings. The results of the study were used solely for academic and research purposes and were not intended for commercial, personal, or other inappropriate use.

Acknowledgments

The researcher expresses sincere gratitude to all the individuals and institutions whose support, guidance, and cooperation contributed to the successful completion of this study.

Special appreciation is extended to Dr. Pinky B. Carig, English language editor, for her careful review of the manuscript and for her valuable corrections and suggestions that enhanced its clarity, coherence, and grammatical accuracy.

The researcher also gratefully acknowledges Dr. Maria Luisa D. Servando, CESO VI, Schools Division Superintendent, and Dr. Jocelyn A. De Castro, District Supervisor, for granting permission and extending their support in the conduct of the study. Likewise, heartfelt appreciation is extended to the school heads, Ma'am Babylyn M. Pomarejos, Ma'am Angelita O. Geniza, Sir Alvin S. Yarra, Dr. Giovanni J. Favila, Sir Juvi Rosh C. Rabulan, Ma'am Janette O. Gumba, Ma'am Hiedi L. Hernandez, and Ma'am Rina M. Gardoce, for their encouragement, assistance, and cooperation throughout the research process.

Sincere thanks are also extended to the Grade 6 teachers for their valuable assistance in coordinating the administration of the research instruments and ensuring the smooth conduct of data collection in their respective schools.

The researcher is deeply grateful to the Grade 6 learners and their parents from the eight public elementary schools in Victoria District for their participation, cooperation, and willingness to serve as respondents, making this study possible.

Finally, the researcher acknowledges the authors and developers of the standardized and adapted research instruments utilized in this study. Their scholarly

contributions provided reliable and valid measures that served as essential tools in gathering the data needed for this research

REFERENCES

- Adlof, S. M., & Hogan, T. P. (2018). Understanding dyslexia in the context of developmental language disorders. *Language, Speech, and Hearing Services in Schools*, 49(4), 762–773. https://doi.org/10.1044/2018_LSHSS-DYSLC-18-0049
- Barkley, R. A. (1997). Behavioral inhibition, sustained attention, and executive functions: Constructing a unifying theory of ADHD. *Psychological Bulletin*, 121(1), 65–94. <https://doi.org/10.1037/0033-2909.121.1.65>
- Black, K. (2025, June 6). Poverty in school. Let's Go Learn. <https://www.letsgolearn.com>
- Burgess, S. R., Hecht, S. A., & Lonigan, C. J. (2019). Relations of the home literacy environment (HLE) to the development of reading-related abilities: A one-year longitudinal study. *Reading Research Quarterly*, 37(4), 408–426. <https://doi.org/10.1598/RRQ.37.4.4>
- Catts, H. W. (2021). Rethinking how to promote reading comprehension. *American Educator*, Winter 2021–2022. <https://www.aft.org/ae/winter2021-2022/catts>
- Collins, A. A., Lindström, E. R., & Compton, D. L. (2018). Comparing students with and without reading difficulties on reading comprehension assessments: A meta-analysis. *Journal of Learning Disabilities*, 51(2), 108–123. <https://journals.sagepub.com/doi/10.1177/0022219417704636>
- Creswell, J. W., & Creswell, J. D. (2023). *Research design: Qualitative, quantitative, and mixed methods approaches* (6th ed.). SAGE Publications. <https://us.sagepub.com/en-us/nam/research-design/book270550>
- Damayanti, R. V., Inawati, I., Ilahude, F. F., & Marbun, C. M. (2025). Reading comprehension challenge on English language faced by students: A systematic review. *Scope: Journal of English Language Teaching*, 10(1). <https://doi.org/10.30998/wke3qr48>
- Department of Education. (2018). DepEd Order No. 14, s. 2018: Policy guidelines on the administration of the Philippine Informal Reading Inventory (Phil-IRI). <https://www.deped.gov.ph/2018/03/26/do-14-s-2018-policy-guidelines-on-the-administration-of-the-revised-philippine-informal-reading-inventory/>
- Enomar, R. R., & Ferenal, E. S. (2025). Factors affecting reading comprehension and learners' performance in select districts of Malaybalay City. *International Journal of Multidisciplinary Research and Analysis*, 8(7), 3796–3805. <https://doi.org/10.47191/ijmra/v8-i07-09>
- Fernández-Otoya, F. A., Raposo-Rivas, M., & Halabi-Echeverry, A. X. (2022). A qualitative systematic literature review on phonological awareness in preschoolers supported by information and communication technologies. *Education Sciences*, 12(6), 382. <https://doi.org/10.3390/educsci12060382>
- Gasis, O. B. (2025). Benchmarking reading proficiency: Evaluating reading levels among Grade 6 pupils of Pagbilao Central Elementary School. *Aloysian*

- Interdisciplinary Journal of Social Sciences, Education, and Allied Fields, 1(9).
<https://doi.org/10.5281/zenodo.17304064>
- Guo, D., Feng, L., & Hodges, T. S. (2022). Differentiating reading profiles of children with specific comprehension deficits from skilled readers: A systematic review. *Learning Disability Quarterly*, 46(2), 174–186.
<https://doi.org/10.1177/07319487221085277>
- Hoover, W. A. (2024). The simple view of reading and its broad types of reading difficulties. *Reading and Writing*, 37, 2277–2298. The simple view of reading and its broad types of reading difficulties | Reading and Writing | Springer Nature Link
- Lagdaan, R. M. B., & Sevilla, N. B. (2025). The effectiveness of reading comprehension strategies in enhancing literacy skills of junior high school students in the Philippines: A systematic review. *Research and Analysis Journal*, 8(08), 21–28.
<https://doi.org/10.18535/raj.v8i08.560>
- Miñoza, M. V., & Montero, M. A. (2019). Reading comprehension level among intermediate learners. *Scientific International (Lahore)*, 31(3), 561–568.
<https://files.eric.ed.gov/fulltext/ED596833.pdf>
- Nation, K. (2019). Children's reading difficulties, language, and reflections on the Simple View of Reading. *Journal of Research in Reading*, 42(1), 47–73.
- Niklas, F., & Schneider, W. (2021). Editorial: Children's competencies development in the home learning environment. *Frontiers in Psychology*, 12, 706360.
<https://doi.org/10.3389/fpsyg.2021.706360>
- Nilsson, K., Elwér, Å., Danielsson, H., et al. (2025). Cognitive and language abilities associated with reading in intellectual disability: A systematic review and meta-analysis. *Remedial and Special Education*.
<https://doi.org/10.1177/07419325251328644>
- Organisation for Economic Co-operation and Development. (2019). Education at a glance 2019: OECD indicators. OECD Publishing.
<https://doi.org/10.1787/f8d7880d-en>
- Our World in Data. (2024). Nearly half of teenagers globally cannot read with comprehension. <https://ourworldindata.org/data-insights/nearly-half-of-teenagers-globally-cannot-read-with-comprehension>
- Peng, P., Fuchs, D., Fuchs, L. S., Elleman, A. M., Kearns, D. M., Gilbert, J. K., Compton, D. L., Cho, E., & Patton, S. (2019). A longitudinal analysis of the trajectories and predictors of word reading and reading comprehension development among at-risk readers. *Journal of Learning Disabilities*, 52(3), 195–208. <https://doi.org/10.1177/0022219418809080>
- Pianta, R. C., & Hamre, B. K. (2009). Conceptualization, measurement, and improvement of classroom processes: Standardized observation can leverage capacity. *Educational Researcher*, 38(2), 109–119.
<https://doi.org/10.3102/0013189X09332374>
- Rakesh, D., McLaughlin, K. A., Sheridan, M., Humphreys, K. L., & Rosen, M. L. (2024). Environmental contributions to cognitive development: The role of cognitive stimulation. *Developmental Review*, 73, 101135.
<https://doi.org/10.1016/j.dr.2024.101135>
- Rogde, K., Hagen, Å. M., Melby-Lervåg, M., & Lervåg, A. (2019). The effect of linguistic comprehension instruction on generalized language and reading comprehension

- skills: A systematic review. *Campbell Systematic Reviews*, 15(4), e1059.
<https://doi.org/10.1002/cl2.1059>
- School-to-School International. (2017). Engaging families and communities to support student reading skills development.
<https://www.unicef.org/flnhub/media/1406/file/Family-Community-Engagement-Web-2.pdf>
- UNESCO. (2022). Global education monitoring report 2022: Recovering education after COVID-19. United Nations Educational, Scientific and Cultural Organization.
<https://www.unesco.org/gem-report>
- Vettori, G., Casado Ledesma, L., Tesone, S., & Tarchi, C. (2024). Key language, cognitive and higher-order skills for L2 reading comprehension of expository texts in English as foreign language students: A systematic review. *Reading and Writing*, 37, 2481–2519. <https://link.springer.com/article/10.1007/s11145-023-10479-3>
- Victoria District. (2025). Phil-IRI results [Unpublished Google Sheet]. Department of Education – Victoria District.
- Wentzel, K. R. (1998). Social relationships and motivation in middle school: The role of parents, teachers, and peers. *Journal of Educational Psychology*, 90(2), 202–209.
<https://doi.org/10.1037/0022-0663.90.2.202>
- World Bank. (2022, June 23). 70% of 10-year-olds now in learning poverty, unable to read and understand a simple text. <https://www.worldbank.org/en/news/press-release/2022/06/23/70-of-10-year-olds-now-in-learning-poverty-unable-to-read-and-understand-a-simple-text>

APA Citation:

Reola, R. D. (2026). MULTIDIMENSIONAL ASSESSMENT MODEL OF COGNITIVE, LINGUISTIC, AND ENVIRONMENTAL FACTORS ON READING COMPREHENSION DIFFICULTIES AMONG GRADE 6 LEARNERS. *Ignatian International Journal for Multidisciplinary Research*, 4(8), 483–504.
<https://doi.org/10.5281/zenodo.21850777>

Corresponding author: renilyn.reola@deped.gov.ph

