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VOCABULARY KNOWLEDGE, TEACHER QUESTIONING QUALITY, AND SELF-REGULATION STRATEGIES AS PREDICTORS OF INTERMEDIATE LEARNERS' CRITICAL READING SKILLS

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ABSTRACT

Critical reading is an essential higher-order skill that enables learners to analyze, evaluate, and interpret textual information beyond literal comprehension. Vocabulary knowledge refers to learners' understanding of word meanings and ability to recognize and interpret words in context. It provides a foundation for understanding textual information and engaging in deeper analysis. However, limited research has examined the combined influence of vocabulary knowledge, teacher questioning quality, and self-regulation strategies on intermediate learners' critical reading skills in local public elementary schools. This study examined the relationships among these variables using a predictive-correlational research design involving 150 Grade 4 to Grade 6 learners in Kalilangan East District during School Year 2026-2027 selected through proportionate stratified random sampling. Data were analyzed using frequency, percentage, mean, standard deviation, and Analysis of Variance (ANOVA), as well as inferential statistics. Findings revealed Advanced Vocabulary Knowledge, Very High Teacher Questioning Quality, and High Self-Regulation Strategies, while overall Critical Reading Skills remained at the Developing level. Connecting ideas to real-world situations was the strongest dimension, whereas evaluating texts, distinguishing facts from opinions, and understanding the author's purpose required further development. Collectively, the predictors significantly predicted Critical Reading Skills but explained only a limited portion of learner performance. Vocabulary Knowledge was the only significant unique predictor. The study highlights the importance of vocabulary knowledge and regular practice in developing critical reading. Future researchers are encouraged to investigate additional predictors using larger samples and employ experimental or mixed-methods designs.

Keywords: *vocabulary knowledge, teacher questioning quality, self-regulation strategies, critical reading skills, intermediate learners*

INTRODUCTION

Critical reading is an essential literacy skill that enables learners to evaluate information, distinguish facts from opinions, identify an author's purpose, and connect textual ideas to real-life situations. Unlike literal comprehension, it requires higher-order thinking, interpretation, and evidence-based judgment. However, The 2025 Programme for International Student Assessment (PISA) revealed declining reading performance among OECD countries, particularly in evaluating information, connecting ideas from multiple sources, and critically examining texts. The findings highlight the importance of strengthening learners' critical reading skills to help them assess information, make meaningful connections, and develop sound judgments when reading different texts (OECD, 2026).

The development of critical reading may be influenced by vocabulary knowledge, teacher questioning quality, and self-regulation strategies. The Lexical Quality Hypothesis of Perfetti and Hart (2002) emphasize the importance of well-established word knowledge in constructing meaning from texts. Vygotsky's (1978) Social Constructivist Theory highlights the role of guided learning and social interaction, suggesting that purposeful teacher questions can encourage learners to interpret information and explain their reasoning. Meanwhile, Zimmerman's (2002) Self-Regulated Learning Theory explains how learners plan, monitor, and evaluate their learning through strategies such as setting goals, checking comprehension, and rereading difficult passages. Together, these theories provide a foundation for examining the three variables as potential predictors of critical reading skills.

Previous studies have linked vocabulary knowledge and explicit vocabulary instruction to reading comprehension and strategic word learning (Okkinga et al., 2023; Dixon et al., 2020; Teng, 2022). Philippine studies have likewise examined vocabulary development in relation to reading comprehension, including the use of structured vocabulary instruction (Tavera & Casinillo, 2020; Mercado & Serafica, 2025). Research on teacher questioning suggests that open-ended and higher-order questions can encourage participation, reasoning, and critical thinking (Blything et al., 2020; Achmad & Utami, 2023; Leasa et al., 2023). Similarly, studies on self-regulation and reading-strategy instruction indicate that planning, monitoring, and evaluating comprehension can support reading performance, strategy use, and learning (Mohammadi et al., 2020; Li et al., 2022; Nuñez et al., 2022). However, learners may require explicit instruction and guided practice to apply these skills effectively to complex reading tasks.

Although previous research has explored these factors in relation to reading comprehension and critical thinking, limited evidence addresses their combined predictive contributions to specific dimensions of critical reading among Grade 4–6 learners in Philippine public elementary schools. This study therefore examined learners'

abilities to evaluate texts, distinguish facts from opinions, understand an author's purpose, and connect ideas to real-world situations. Specifically, it aimed to determine the levels of vocabulary knowledge, teacher questioning quality, self-regulation strategies, and critical reading skills; identify differences in vocabulary knowledge according to grade level; examine the associations between the predictor variables and critical reading dimensions; and determine the collective and individual predictive contributions of vocabulary knowledge, teacher questioning quality, and self-regulation strategies to overall critical reading skills. The findings may provide local evidence to guide reading instruction and support Sustainable Development Goal 4 on inclusive, equitable, and quality education.

Research Questions

The study aimed to determine whether vocabulary knowledge, teacher questioning quality, and self-regulation strategies significantly predict the critical reading skills of intermediate learners.

Specifically, the study sought to answer the following questions:

1. What is the participants' level of vocabulary knowledge?
2. What is the participants' assessment of teacher questioning quality?
3. To what extent do the participants use self-regulation strategies?
4. What is the participants' level of critical reading skills in terms of:
   - 4.1. Evaluating texts;
   - 4.2. Distinguishing facts from opinions;
   - 4.3. Understanding the author's purpose; and
   - 4.4. Connecting ideas to the real world?
5. Do the participants' vocabulary knowledge significantly differ considering their Grade level?
6. Are the participants' vocabulary knowledge, teacher questioning quality, and use of self-regulation strategies significantly associated with their Critical Reading Skills?
7. Do vocabulary knowledge, teacher questioning quality, and self-regulation strategies significantly predict the critical reading skills of the participants?

METHODOLOGY

Research Design

The study employed a quantitative predictive-correlational design to examine whether vocabulary knowledge, teacher questioning quality, and self-regulation strategies predicted critical reading skills without manipulating the variables. Descriptive statistics summarized the variables, while regression analysis assessed their individual and combined predictive contributions (Creswell & Creswell, 2018).

Locale of the Study

The study was conducted in three public elementary schools in Kalilangan East District, Bukidnon, Philippines. The locale was selected to examine the critical reading skills of Grade 4–6 learners in a local public-school context. To maintain confidentiality, the schools were identified as School A, School B, and School C.

Respondents and Sampling Procedure

The study involved 150 Grade 4–6 learners from a population of 237 across three public elementary schools. Using Cochran's formula and proportionate stratified random sampling, 58, 59, and 33 learners were selected from Schools A, B, and C, respectively. Participation required official enrollment, parental consent, and learner assent.

Research Instrument

Four instruments were used: an 18-item Vocabulary Knowledge Test adapted with reference to the PPVT-5 (Dunn, 2019); a 17-item Teacher Questioning Practices Questionnaire informed by Pianta et al. (2008) and Walsh (2011); a 15-item Self-Regulation Strategies Questionnaire adapted from Pintrich et al. (1991); and a Critical Reading Skills Test guided by Phil-IRI principles and grade-level competencies (Department of Education, 2018; Pado et al., 2018). The critical reading test assessed text evaluation, fact-opinion distinction, author's purpose, and real-world connections. Three experts validated the instruments, which were pilot-tested with 30 learners excluded from the main sample.

Scoring followed each instrument's procedures. The Vocabulary Knowledge Test awarded one point per correct answer, with performance classified as Advanced (16–18), Proficient (13–15), Developing (9–12), or Beginning (0–8). The two questionnaires used five-point rating scales, interpreted from Very Low (1.00–1.50) to Very High (4.51–5.00). The Critical Reading Skills Test had a maximum score of 20, categorized as Advanced (18–20), Proficient (15–17), Developing (10–14), or Beginning (0–9). Reliability coefficients ranged from .717 to .903 across the instruments and reported grade-level components.

Validity and Reliability

The four research instruments were subjected to expert validation by three experts and pilot-tested with 30 learners who were excluded from the main study. Reliability coefficients ranged from .717 to .903 across the instruments and reported grade-level components, indicating varying levels of internal consistency. The instruments were refined based on the validation and pilot-testing results before their administration to the main participants.

Data Gathering Procedure

Ethical clearance and administrative permissions were secured before data collection. Participation was voluntary, confidentiality was protected, and learners could withdraw without penalty. Data were collected using standardized instructions and scoring procedures, then checked and coded for analysis.

Data Analysis

Statistical treatment included frequencies, percentages, means, and standard deviations to describe the results; Welch's ANOVA to compare vocabulary knowledge across grade levels; canonical correlation analysis to examine multivariate associations; and multiple regression analysis to determine the combined and unique predictive contributions of the three predictor variables. Multicollinearity and residual normality were examined through tolerance, variance inflation factors, the Shapiro–Wilk test, and Q–Q plots. Statistical significance was set at .05, and findings were interpreted as associations and predictions rather than causal relationships.

Scope and Limitations

The study involved 150 Grade 4–6 learners from three public elementary schools in Kalilangan East District, Bukidnon, examining the relationships of vocabulary knowledge, teacher questioning quality, and self-regulation strategies with critical reading skills. Findings were limited to the selected participants, locale, instruments, and variables. Since the study used a predictive-correlational design, it established associations and predictive contributions, not causation, and may not be generalizable to other grade levels or educational settings.

RESULTS

This section presents and discusses the descriptive and inferential findings on the study variables, critical reading dimensions, and relationships among the predictors and critical reading skills using canonical correlation, analysis of variance, and multiple regression analyses.

Critical Reading Skills

Table 1 presents the summary table of the participants' Critical Reading Skills.

Table 1 ***Summary Table of the Participants' Critical Reading Skills***

Variable	Mean	SD	Interpretation
Evaluating Text	3.69	0.83	Developing
Distinguishing Facts from Opinions	3.47	0.75	Developing
Understanding Authors' Purpose	3.68	0.89	Developing
Connecting Idea to the Real World	3.82	1.04	Proficient

Variable	Mean	SD	Interpretation
Overall Critical Reading Skill	**3.67**	**0.40**	**Developing**

Vocabulary Knowledge

Table 2 presents Analysis of Variance Summary of the Participants' Between Grade Levels on their Vocabulary Knowledge.

Table 2 ***Analysis of Variance Summary of the Participants' Between Grade Levels on their Vocabulary Knowledge***

Grade Level	M	SD	Interpretation	F(2,90)	p	η^2
Grade 4	15.60	3.10	Proficient			
Grade 5	16.80	2.38	Advanced	2.82	0.065	0.048
Grade 6	16.70	1.54	Advanced			

Note. M = mean, SD = standard deviation, η^2 = effect size. Effect size interpretation: 0.01 to 0.05 is small, 0.06 to 0.13 is medium, above or equal 0.14 is large.

Table 3 presents the Canonical Correlation Analysis of the Participants' Between Critical Reading Skills and Vocabulary Knowledge.

Table 3 ***Canonical Correlation Analysis of the Participants' Between Critical Reading Skills and Vocabulary Knowledge***

Variable	Cross loading	R_c	R_c^2	F(4,145)	p
Vocabulary Knowledge	-0.25				
Critical Reading Skills					
Evaluating Text	-0.21	0.25	0.06	2.335	0.058
Distinguishing Facts From Opinions	-0.02				
Understanding Authors' Purpose	-0.06				
Connecting Idea to the Real World	-0.09				

**Significant at 0.05 two-tailed alpha level.*

Teacher Questioning Quality

The table below presents the Canonical Correlation Analysis of the Participants' Between Critical Reading Skills and Teacher Questioning Quality

Table 4 ***Canonical Correlation Analysis of the Participants' Between Critical Reading Skills and Teacher Questioning Quality***

Variable	Cross loading	R_c	R_c^2	F(4,145)	p
Teacher's Questioning Quality	-0.14				
Critical Reading Skills					
Evaluating Text	-0.11	0.14	0.02	0.773	0.545
Distinguishing Facts From Opinions	-0.04				
Understanding Authors' Purpose	-0.05				
Connecting Idea to the Real World	-0.04				

**Significant at 0.05 two-tailed alpha level.*

Self-Regulation Strategies

Table 5 presents the Canonical Correlation Analysis of the Participants' Between Critical Reading Skills and Self-Regulation Strategies

Table 5 ***Canonical Correlation Analysis of the Participants' Between Critical Reading Skills and Self-Regulation Strategies***

Variable	Cross loading	R_c	R_c^2	F(4,145)	p
Self-regulation Strategies	-0.13				
Critical Reading Skills					
Evaluating Text	0.10	0.13	0.02	0.650	0.628
Distinguishing Facts From Opinions	0.04				
Understanding Authors' Purpose	0.05				
Connecting Idea to the Real World	-0.07				

**Significant at 0.05 two-tailed alpha level.*

Table 6 presents the Regression Analysis of the Participants' Vocabulary Knowledge, Teacher's Questioning Quality and Self-regulation Strategies on Critical Reading Skills

Table 6 Regression Analysis of the Participants' Vocabulary Knowledge, Teacher's Questioning Quality and Self-regulation Strategies on Critical Reading Skills

Predictor	Unstandardized Coefficients		β	95% CI		t	p
	B	SE		Lower	Upper		
Constant	9.61	2.38		4.91	14.30	4.043*	<.001
Vocabulary Knowledge	0.12	0.05	0.183	0.01	0.22	2.250*	0.026

Predictor	Unstandardized Coefficients		β	95% CI		t	p
	B	SE		Lower	Upper		
Teacher's Questioning Quality	0.95	0.53	0.161	-0.09	2.00	1.799	0.074
Self-Regulation Strategies	-0.32	0.28	-0.101	-0.88	0.24	-1.131	0.260
Model Summary							
$R=0.252$ $R^2=0.064$ Adj $R^2=0.045$ $F(3,146)=3.314^*$ $p=0.022$							

*Note. B = unstandardized beta coefficient, SE = standard error, β = standardized beta coefficient, 95% CI = 95% confidence interval, t = t statistic, p = probability value. *Significant at 0.05 two-tailed alpha level.*

Model Equation: CRS = 0.12VK + 9.61

Legend: CRS = Critical Reading Skills, VK = Vocabulary Knowledge

DISCUSSION

This section presents and discusses the descriptive and inferential findings on the study variables, critical reading dimensions, and relationships among the predictors and critical reading skills using canonical correlation, analysis of variance and multiple regression analyses.

1.1.1 Summary Table of the Participants' Critical Reading Skills

Table 1. presents the participants' critical reading skills across four dimensions, obtained an overall mean of 3.67 (*SD* = 0.40), interpreted as Developing. Connecting ideas to the real world ranked highest (*M* = 3.82, Proficient), while distinguishing facts from opinions ranked lowest (*M* = 3.47, Developing). These findings indicate that learners were better at relating texts to familiar experiences but needed further instruction in evaluating texts, identifying the author's purpose, and distinguishing facts from opinions. Meaningful reading experiences and explicit, sustained instruction may help strengthen these higher-order critical reading skills (Bates, 2023; Faizah et al., 2026).

1.1.2 Analysis of Variance Summary of the Participants' Between Grade Levels on their Vocabulary Knowledge

Table 2 shows the overall mean score was approximately 16.37, interpreted as Advanced based on the scoring criteria. The effect size was small ($\eta^2 = 0.048$), indicating that grade level accounted for only a small proportion of the variance in vocabulary scores. Descriptively, Grade 4 students achieved a proficient level with the lowest mean score (*M* = 15.60, *SD* = 3.10). Grade 5 students achieved an advanced level with the highest mean score (*M* = 16.80, *SD* = 2.38). Grade 6 students also scored at an advanced level, with a slightly lower mean score (*M* = 16.70, *SD* = 1.54), but demonstrated the least variability within their group. These findings imply that advancing from fourth to sixth grade does not automatically guarantee a meaningful increase in vocabulary performance within

this specific population. Other factors, such as learning experiences and individualized instruction, may also influence vocabulary development. Therefore, teachers should provide differentiated vocabulary instruction based on learners' needs to strengthen word knowledge and support critical reading development.

1.1.3 Canonical Correlation Analysis of the Participants' Between Critical Reading Skills and Vocabulary Knowledge

Table 3 shows the canonical correlation analysis showed a canonical correlation coefficient of Rc = 0.25 and Rc^2 = 0.06, indicating a limited association between Vocabulary Knowledge and the four dimensions of Critical Reading Skills. The relationship was not statistically significant, ($F(4,145) = 2.335$, $p = 0.058$), suggesting that vocabulary knowledge did not demonstrate a significant multivariate relationship with the critical reading dimensions when examined together. Although vocabulary knowledge supports reading comprehension and higher-order literacy development (Kim et al., 2021; Okkinga et al., 2023), understanding words alone may not be sufficient for evaluating information, distinguishing facts from opinions, and identifying the author's purpose (Metsala, 2026; Khatami et al., 2026). Therefore, vocabulary instruction should be combined with explicit and sustained activities that develop learners' abilities to analyze texts, evaluate evidence, interpret ideas, and connect textual information to real-world situations (Habók et al., 2026).

1.1.4 Canonical Correlation Analysis of the Participants' Between Critical Reading Skills and Teacher Questioning Quality

Table 4 presents the canonical correlation analysis revealed a correlation coefficient of Rc = 0.14 and Rc^2 = 0.02, indicating a weak association between Teacher Questioning Quality and the four dimensions of Critical Reading Skills. The relationship was not statistically significant, ($F(4,145) = 0.773$, $p = 0.545$), suggesting that perceived teacher questioning quality was not significantly associated with the critical reading dimensions when examined together. Nevertheless, higher-order questioning can support learners' critical thinking and reasoning when questions encourage deeper analysis rather than simple recall (Achmad & Utami, 2023; Leasa et al., 2023). Effective reading instruction also involves modeling, feedback, guided practice, and appropriate learning materials (Hudson et al., 2021). Therefore, teachers should integrate evidence-based questioning with explicit reading activities that develop learners' abilities to analyze, interpret, and evaluate texts (Nurhayati et al., 2023).

1.1.5 Canonical Correlation Analysis of the Participants' Between Critical Reading Skills and Self-Regulation Strategies

Table 5 shows the canonical correlation analysis yielded Rc = 0.13 and Rc^2 = 0.02, indicating a weak association between Self-Regulation Strategies and the four dimensions of Critical Reading Skills. The relationship was not statistically significant, ($F(4,145) = 0.650$, $p = 0.628$), suggesting that self-regulation strategies were not significantly associated with the critical reading dimensions when examined together.

Nevertheless, self-regulation supports learners in planning, monitoring, and managing their learning (Núñez et al., 2022), while reading strategy instruction can improve strategy use, motivation, self-efficacy, and comprehension (Li et al., 2022). Self-regulated learning may also support vocabulary development and reading comprehension when metacognitive strategies are applied to specific learning tasks (Wu & Wang, 2026). Therefore, teachers should integrate self-regulation strategies with explicit critical reading activities that develop learners' abilities to analyze texts, evaluate evidence, distinguish facts from opinions, and identify the author's purpose.

1.1.6 Regression Analysis of the Participants' Vocabulary Knowledge, Teacher's Questioning Quality and Self-regulation Strategies on Critical Reading Skills

Table 6 The multiple regression analysis showed that Vocabulary Knowledge, Teacher Questioning Quality, and Self-Regulation Strategies collectively significantly predicted Critical Reading Skills, ($F(3,146) = 3.31$, $p = 0.022$), with ($R = 0.252$), ($R^2 = 0.064$), and adjusted ($R^2 = 0.045$). The model explained 6.4% of the variance, indicating limited predictive power. Vocabulary Knowledge was the only significant positive predictor ($\beta = 0.183$, $p = 0.026$), supporting its importance in reading achievement and literacy development (Kim et al., 2021; Okkinga et al., 2023; Habók et al., 2026). Although Teacher Questioning Quality and Self-Regulation Strategies were not significant unique predictors, higher-order questioning can promote critical thinking (Achmad & Utami, 2023), while self-regulation supports reading comprehension and learning (Núñez et al., 2022). These findings highlight the need to strengthen vocabulary instruction alongside meaningful reading activities and to investigate additional factors that may explain learners' critical reading performance. These findings highlight the need to strengthen vocabulary instruction alongside meaningful reading activities and to investigate additional factors that may explain learners' critical reading performance.

Summary, Conclusions and Recommendations

The study examined the relationships of Vocabulary Knowledge, Teacher Questioning Quality, and Self-Regulation Strategies to the Critical Reading Skills of 150 Grade 4 to Grade 6 learners from three public elementary schools using a quantitative predictive-correlational design. Data were gathered through validated and pilot-tested instruments and analyzed using descriptive statistics, canonical correlation, and multiple regression at the .05 significance level. Findings revealed Advanced Vocabulary Knowledge, Very High Teacher Questioning Quality, and High Self-Regulation Strategies, while overall Critical Reading Skills remained at the Developing level. Connecting ideas to real-world situations was the strongest dimension, whereas evaluating texts, distinguishing facts from opinions, and identifying the author's purpose required further improvement. Collectively, the three predictors significantly predicted Critical Reading Skills, but their explanatory power was limited. Vocabulary Knowledge emerged as the only significant unique predictor.

The study concludes that strong vocabulary knowledge, positive classroom questioning practices, and regular use of self-regulation strategies do not necessarily ensure well-developed critical reading skills. Although Vocabulary Knowledge provides an important foundation for understanding and interpreting textual information, learners need explicit and sustained practice in analyzing evidence, evaluating ideas, distinguishing facts from opinions, and identifying the author's purpose. Teacher Questioning Quality and Self-Regulation Strategies remain valuable instructional components, although they did not significantly contribute uniquely to critical reading performance in the regression model. The limited explanatory power of the predictors also suggests that other learner, instructional, and contextual factors may influence critical reading development.

Teachers are encouraged to integrate vocabulary instruction, higher-order questioning, text analysis, rereading, and comprehension-monitoring strategies into regular reading lessons. School administrators and reading coordinators may organize school-based Learning Action Cell sessions, provide appropriate reading materials, and strengthen reading programs targeting higher-order skills. Parents and guardians may support daily reading at home and help children understand unfamiliar words and textual ideas. Curriculum developers may design grade-appropriate activities that integrate vocabulary development with critical reading tasks. Future researchers are encouraged to examine additional predictors using larger and more diverse samples and employ experimental or mixed-methods designs to develop and evaluate effective interventions for improving learners' critical reading skills.

Compliance with Ethical Standards

The study observed ethical standards throughout the study by securing the necessary ethical clearance and administrative permissions. Informed consent from parents or legal guardians and assent from learners were obtained before data collection. Participation was voluntary, and respondents were free to withdraw at any time without penalty. Their anonymity, confidentiality, privacy, and well-being were protected, and all collected information was used solely for research purposes. The researcher ensured fairness, minimized possible risks, avoided bias and plagiarism, and maintained no conflict of interest.

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