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Influence of AI-assisted learning, digital distractions, and metacognitive reading strategies on Grade 12 students' critical reading skills

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Abstract

Aim: This study examined how artificial intelligence (AI)-assisted learning, digital distractions, and metacognitive reading strategies influence the critical reading skills of Grade 12 learners in the Philippine context, with implications for improving instructional practices in reading education.

Methodology: A descriptive-correlational research design was employed involving 261 Grade 12 learners from a public school in Cagayan de Oro City. Data were collected using adapted questionnaires and a performance-based measure. Descriptive statistics were used to determine the levels of the variables, while multiple regression analysis examined their significant influence on critical reading performance.

Results: Findings revealed that learners demonstrated high levels of AI-assisted learning use, digital distractions, and metacognitive reading strategies, along with fair critical reading skills. Regression analysis showed that AI-assisted learning and digital distractions did not significantly influence critical reading skills, whereas metacognitive reading strategies emerged as the only significant predictor ($B = 1.97$, $p < .001$).

Conclusion: The study concludes that metacognitive reading strategies play a more critical role in developing students' critical reading skills than AI-assisted learning or exposure to digital distractions. These findings suggest that educators should prioritize explicit instruction of metacognitive strategies and integrate technology in ways that support strategic reading processes. Curriculum developers and school leaders may also consider embedding metacognitive skill development into reading programs to enhance learners' higher-order comprehension and critical thinking outcomes.

Keywords: *AI-assisted learning, digital distractions, metacognitive reading strategies, critical reading skills, Grade 12 learners*

INTRODUCTION

In the 21st century, education has been reshaped by the rapid integration of artificial intelligence (AI), the dominance of digital technologies, and the growing recognition of metacognitive strategies in learning. AI-driven adaptive systems have increasingly transformed instructional design and student engagement across educational levels (Strielkowski et al., 2025; Kerimbayev et al., 2025), while the convergence of technology and pedagogy continues to redefine how learners access and process information (Alam & Mohanty, 2023). For Grade 12 students who stand at the gateway to higher education, reading extends beyond basic understanding toward critical analysis, evaluation of information, and synthesis of ideas across sources. These competencies are essential for academic success and participation in a knowledge-driven society, yet many Filipino learners continue to struggle due to technological and cognitive challenges that affect higher-order literacy development (Biares, 2021; Akintayo et al., 2024).

International assessments such as the Programme for International Student Assessment (PISA) 2018 and 2022 indicated that Filipino students remained below global standards in reading proficiency, particularly in analytical and evaluative dimensions (Cabural, 2024). Critical reading involves evaluating evidence, identifying bias, weighing arguments, and integrating insights from complex texts (Joshi, 2025). These persistent gaps emphasized the need for research that explored deeper cognitive and technological factors shaping students' reading performance rather than focusing solely on surface-level comprehension.

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Despite growing literature on AI integration, digital distraction, and metacognition, research often examined these variables in isolation. Studies on AI tended to focus on technological efficiency or ethical considerations without linking them directly to reading outcomes (Ademola, 2024; Kudritskaya, 2024; Nnorom, 2025; Zhai et al., 2024). More recent scholarship has begun to examine how AI tools affect cognitive offloading and critical thinking, raising questions about whether AI-assisted learning fosters or undermines deeper literacy skills (Gerlich, 2025; Ouma et al., 2025; Kaswan et al., 2024). Research on digital distraction commonly investigated attention and multitasking rather than higher-order literacy development (Flanigan & Titsworth, 2020; Gkintoni et al., 2025; Upshaw, 2025; Pérez-Juárez et al., 2023), while metacognitive studies rarely explored interactions with emerging technologies in Filipino contexts (Villanueva, 2022; Bernardo & Mante-Estacio, 2023; Ghimire & Mokhtari, 2025). Limited empirical work in the Philippines connected these factors to critical reading among senior high school learners. The present study, therefore, examined how AI-assisted learning, digital distractions, and metacognitive reading strategies influenced the critical reading skills of Grade 12 students, providing a more integrated understanding of the challenges and opportunities shaping contemporary literacy development.

This study differs from previous research in three main respects. First, the prior literature analyzed AI-assisted learning, digital distraction, and metacognitive strategies in isolation from each other, while this study presents a more integrated version of AI-assisted learning, digital distractions, and metacognitive reading, incorporating critical reading as a higher-order literacy construct – that is evaluative, analytic, and synthetic literacy dimensions that are becoming increasingly clearly articulated in curricular documents. Second, while most existing studies focused on more general reading comprehension or superficial "talented" outcomes, that this study has aimed to contribute to the limited literature on critical reading as a specific higher-order literacy skill. Finally, unlike the majority of comparable studies situated in the Western or East Asian context, we are specifically "anchored" in the senior high context in the Philippines with its own linguistic, cultural and technological realities that are underrepresented in the global literacy research base.

In summary, this study examined the extent to which AI-assisted learning, digital distractions, or metacognitive reading, shaped the critical reading skills of Grade 12 students. The research aims to synthesize the fragmented literature in this field and to illuminate the issues and possibilities that define the social practice of digital literacy in the present day. The results of this research have profound implications on various levels of the education system. In the case of classroom teachers, the findings can be used to design reading instruction that intentionally involves the use of metacognitive strategy training and makes concessions to the disruptive nature of digital technologies on analytical reading that is sustained. To curriculum designers and instructional designers, the study provides evidence-based information that can inform how AI-assisted tools can be integrated to reinforce, instead of undermine, higher-order literacy competencies. The findings can inform the decision of school administrators and educational policymakers especially in the Philippine basic education context with regard to policies on technology use, digital literacy, and specific interventions with the intention of reducing the ongoing reading proficiency gaps as recorded in international assessments.

Review of Related Literature and Studies

Various sources were examined to provide a comprehensive understanding of the variables of the study, including critical reading skills, artificial intelligence-assisted learning, digital distractions, and metacognitive reading strategies. These references served as the foundation for analyzing the independent and dependent variables and their relationships within the study context.

Critical Reading Skills

Critical reading skills are essential for learners in the 21st century, particularly in engaging with complex and diverse texts in both print and digital formats. These skills involve higher-order processes such as analyzing arguments, evaluating evidence, and synthesizing meanings rather than simply understanding content (Archila et al., 2024; Angraini, 2024). Students with strong critical reading abilities demonstrated better academic performance, reasoning, and writing outcomes (Al Roomy, 2022; Rahmasari, 2024). However, in the Philippine context, many learners struggled to develop these skills due to limited exposure to explicit instructional strategies, and the rise of digital environments further complicated this issue by exposing students to misinformation (McRae, 2022; Derotas & Barcelona, 2023).

Artificial Intelligence-Assisted Learning

AI-assisted learning has emerged as a significant innovation in education, offering opportunities for personalized, adaptive, and engaging learning experiences. AI tools supported comprehension and higher-order thinking by providing real-time feedback, scaffolding learning, and tailoring content to students' needs (Strielkowski et al., 2025; Shalaby, 2024). However, concerns regarding overreliance on AI, which may lead to cognitive offloading and

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reduced critical thinking, have been raised (Gerlich, 2025; Ouma et al., 2025). Existing studies rarely examined how the frequency, duration, and variety of AI use collectively influenced critical reading skills among K–12 learners in the Philippines (Co, 2025).

Digital Distractions

Digital distractions have become a significant challenge in modern learning environments, particularly with the widespread use of smartphones and online platforms. Interruptions such as notifications, multitasking, and exposure to non-academic content negatively affected students' attention, comprehension, and academic performance (Alam et al., 2025; Murakami et al., 2025). Digital distractions took the form of push distractions, such as notifications, and habit distractions, such as frequent checking of devices, both of which hindered sustained attention (Upshaw, 2025; Althobiati, 2025). Despite extensive research on these effects, there was limited evidence in the Philippine K–12 context examining how different types of digital distractions collectively influenced critical reading skills.

Metacognitive Reading Strategies

Metacognitive reading strategies are widely recognized as essential components of effective reading comprehension. These strategies involved planning, monitoring, and evaluating one's reading processes, allowing learners to actively regulate their understanding and engagement with texts (Ghimire & Mokhtari, 2025; Huang, 2025; Dolotallas & Barcelona, 2025). Students who used metacognitive strategies demonstrated deeper comprehension, better retention, and stronger critical thinking skills (Jahan, 2025). However, there was limited research on the long-term sustainability of these strategies and their application in digital learning environments, particularly in the Philippine senior high school context, indicating a need for more integrated and localized research.

The reviewed literature combined suggests that critical reading cannot grow in isolation, but is influenced by evolving technology, cognition, and instruction. While individual bodies of research have separately shown AI-assisted learning to perhaps scaffold comprehension (Strielkowski et al., 2025; Shalaby, 2024), digital distractions to run counter to our capacity for sustained attention and critical engagement (Upshaw, 2025; Gkintoni et al., 2025), and metacognitive reading strategies to likely enhance text-level understanding (Ghimire & Mokhtari, 2025; Jahan, 2025), no single study has explored how these three variables simultaneously affect critical reading performance. For this reason, the gap is greatest in the context of senior high schools in the Philippines, where continuing deficits in reading skills revealed in wide-ranging international assessments (Cabural, 2024) are contrasted by fast-paced but little-explored changes in how learners interact with AI, digital technologies, and self-regulated approaches to reading. Without integrative, locally conducted research, teachers and curriculum or policy designers are left without the tools needed to construct and explore evidence-based interventions that can grapple with the full complexity of what influences reading skills in their students. It is toward this gap that the current study directly speaks, investigating in one simultaneous project the intersection of AI-assisted learning, metacognitive reading strategies, and digital distractions as predictors of critical reading skills in one sample, Grade 12 students.

Theoretical Framework

This study was anchored on three interrelated theories: the Constructivist Theory of Learning, the Cognitive Load Theory, and the Metacognitive Theory. The Constructivist Theory of Learning by Piaget (1972) and Vygotsky (1978) explained that learning is an active and dynamic process in which learners construct knowledge through interaction with their environment, tools, and social context. In contemporary classrooms, AI-assisted learning provided immediate feedback, guided support, and opportunities for deeper engagement, allowing students to analyze, evaluate, and synthesize information—core components of critical reading.

In contrast, the Cognitive Load Theory proposed by Sweller (1988) posited that learners have limited working memory capacity, and learning is hindered when cognitive load exceeds this limit. Digital distractions such as notifications, multitasking, and constant device interaction contributed to extraneous cognitive load, interfering with comprehension and higher-order thinking processes. Building on these perspectives, the Metacognitive Theory by Flavell (1979) highlighted the importance of self-regulation in the learning process. Through planning, monitoring, and evaluating their own reading strategies, students became more aware of their comprehension and adjusted their strategies accordingly. Metacognition helped students manage the challenges posed by digital distractions and use AI tools more effectively and responsibly.

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Conceptual Framework

This study was anchored on the assumption that students' critical reading skills were influenced by three key independent variables: AI-assisted learning, digital distractions, and metacognitive reading strategies. Critical reading was examined through three dimensions: analyzing complex arguments, evaluating information, and synthesizing the author's intentions (Li & Wan, 2022; Nolan, 2024; Deane, 2020). AI-assisted learning was conceptualized in terms of frequency of use, duration of time spent, and variety of academic activities. Digital distractions were categorized into push distractions and habit distractions (Pérez-Juárez et al., 2023). Metacognitive reading strategies encompassed planning, monitoring, and evaluating (Flavell, 1979; Brown & Pressley, 2023). The framework proposed that AI-assisted learning and digital distractions may either support or hinder students' critical reading skills, while metacognitive reading strategies served as the key mechanism strengthening learners' ability to engage in higher-order reading processes.

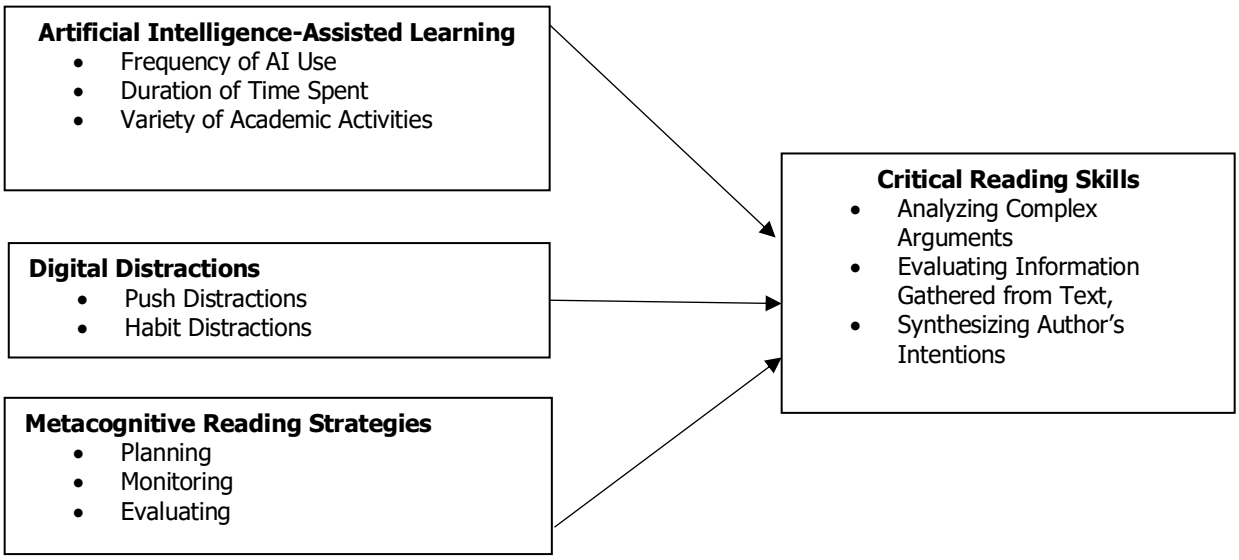


Figure 1. Schematic diagram showing the Interplay of the variables in the study.

Statement of the Problem

Despite the growing integration of digital technologies and artificial intelligence (AI) tools in Philippine senior high school classrooms, limited empirical evidence exists on how these factors, alongside metacognitive reading strategies, collectively influence the critical reading skills of Grade 12 learners. While previous studies have examined AI use, digital distractions, and metacognition independently, no locally grounded and integrative research has investigated their combined effects on higher-order reading performance among senior high school students.

This gap is particularly significant in light of the consistently below-average performance of Filipino learners in international assessments such as the Programme for International Student Assessment (PISA) 2018 and 2022, which revealed persistent weaknesses in analytical and evaluative reading competencies. These challenges have direct implications for teaching practices, curriculum development, and instructional design, particularly in preparing learners for higher education and knowledge-based environments.

Thus, this study was conducted to determine the influence of AI-assisted learning, digital distractions, and metacognitive reading strategies on the critical reading skills of Grade 12 students enrolled in a public school in Cagayan de Oro City during the academic year 2025–2026, with the end in view of informing more effective reading instruction and technology integration in education.

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Research Objectives

General Objective

To determine the influence of AI-assisted learning, digital distractions, and metacognitive reading strategies on the critical reading skills of Grade 12 students.

Specific Objectives

Specifically, the study aimed to:

1. Assess the extent of AI-assisted learning among Grade 12 participants in terms of:
   1.1 frequency of use;
   1.2 duration of time spent; and
   1.3 variety of academic activities.
2. Determine the level of digital distractions experienced by the participants in terms of:
   2.1 push distractions; and
   2.2 habit distractions.
3. Describe the level of metacognitive reading strategies employed by the participants in terms of:
   3.1 planning;
   3.2 monitoring; and
   3.3 evaluating.
4. Evaluate the level of critical reading skills of the participants in terms of:
   4.1 analyzing complex arguments;
   4.2 evaluating information gathered from text; and
   4.3 synthesizing the author's intentions.
5. Examine the significant influence of AI-assisted learning, digital distractions, and metacognitive reading strategies on the critical reading skills of Grade 12 students.

Research Questions

The study was guided by the following research questions:

1. What is the extent of AI-assisted learning among Grade 12 participants in terms of frequency of use, duration of time spent, and variety of academic activities?
2. What is the level of digital distractions experienced by the participants in terms of push distractions and habit distractions?
3. What is the level of metacognitive reading strategies employed by the participants in terms of planning, monitoring, and evaluating?
4. What is the level of critical reading skills of the participants in terms of analyzing complex arguments, evaluating information gathered from text, and synthesizing the author's intentions?
5. Do AI-assisted learning, digital distractions, and metacognitive reading strategies significantly influence the critical reading skills of Grade 12 students?

Hypotheses

To align with the inferential analysis, the following null hypotheses were formulated:

H_{01}: AI-assisted learning has no significant influence on the critical reading skills of Grade 12 students.
H_{02}: Digital distractions have no significant influence on the critical reading skills of Grade 12 students.
H_{03}: Metacognitive reading strategies have no significant influence on the critical reading skills of Grade 12 students.
H_{04}: AI-assisted learning, digital distractions, and metacognitive reading strategies do not collectively have a significant influence on the critical reading skills of Grade 12 students.

METHODS

Research Design

The study employed a descriptive-correlational research design, which aimed to identify and analyze the relationship between two or more variables without manipulation (Putri et al, 2025). This design enabled the collection of quantitative data through surveys, which were statistically analyzed to determine the strength and direction of associations among AI-assisted learning, digital distractions, and metacognitive reading strategies in relation to

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students' critical reading skills. This approach was particularly appropriate as it allowed the researchers to observe natural patterns without manipulating variables, ensuring that findings reflected real-world classroom conditions.

Population and Sampling

The study involved 261 Grade 12 senior high school students from a public school in Cagayan de Oro City during the academic year 2025–2026. To determine the appropriate sample size, Taro Yamane's (1967) formula was applied prior to sampling, using a 5% margin of error against a total population of 747 students, which yielded a computed sample size of 261. Prior to the main data collection, 30 students participated in pilot testing to validate the research instruments; these students were excluded from the final sample to prevent test-retest bias. Stratified random sampling was then employed to select the 261 respondents to ensure proportional representation across strands—Science, Technology, Engineering, and Mathematics (STEM), Accountancy, Business, and Management (ABM), Humanities and Social Sciences (HUMSS), and Technical-Vocational-Livelihood (TVL)—thereby minimizing sampling bias and enhancing the generalizability of the findings.

Instruments

The study utilized a researcher-developed structured questionnaire based on the reviewed literature and aligned with the study's conceptual framework. The instrument consisted of four sections: AI-assisted learning, digital distractions, metacognitive reading strategies, and critical reading skills. Each section employed a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).

A performance-based test was also administered to assess critical reading skills, focusing on analyzing complex arguments, evaluating information, and synthesizing the author's intentions.

The instrument underwent content validation by three experts in educational research and language instruction to ensure clarity, relevance, and alignment with the study variables. A pilot test involving 30 Grade 12 students was conducted to establish reliability. The results yielded acceptable internal consistency, with Cronbach's alpha coefficients exceeding the recommended threshold of 0.70 for all scales.

Data Collection

Prior to data gathering, formal permission was secured from the school principal, followed by coordination with teachers to schedule classroom visits. Data collection was conducted during the second semester of the academic year 2025–2026, specifically from January to February 2026. During the administration, clear instructions were provided to guide students in answering the questionnaire honestly and carefully. Paper-based instruments were utilized to ensure accessibility and avoid technical limitations. Responses were systematically collected, coded, and encoded into a secure digital database. All data were handled following strict protocols, including anonymization through numeric coding, restricted access to authorized personnel, and secure storage in both physical and digital formats.

Treatment of Data

For research questions 1 to 4, descriptive statistics, including frequency, percentage, mean, and standard deviation, were utilized to determine the extent and level of AI-assisted learning, digital distractions, metacognitive reading strategies, and critical reading skills. For research question 5, multiple regression analysis was employed to examine whether the three independent variables significantly influenced critical reading skills. Prior to conducting the regression analysis, the necessary statistical assumptions—normality, linearity, homoscedasticity, and absence of multicollinearity—were tested and found to be satisfactorily met.

Ethical Considerations

The study was guided by the ethical principles of the Belmont Report (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1979), namely Respect for Persons, Beneficence, and Justice. Ethical clearance was obtained from the Research Ethics Committee. Informed consent was obtained from all participants, who were fully informed about the purpose, procedures, and voluntary nature of their participation. Confidentiality was strictly maintained by removing all identifying information and presenting results only in aggregate form. In compliance with the Data Privacy Act of 2012 (Republic Act No. 10173), all data were securely stored and disposed of properly upon completion of the study.

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RESULTS AND DISCUSSION:

This section presents the findings drawn from the study.

1. Extent of AI-Assisted Learning:

Table 1 presents the summary of AI-assisted learning across the three measured dimensions. The findings showed a general mean of 3.58, interpreted as High, with a standard deviation of 0.57, indicating that most respondents reported consistently strong engagement with AI tools in their academic routines. Among the dimensions, Variety of Academic Activities obtained the highest mean score (M = 3.78, SD = 0.52), followed by Frequency of AI Use (M = 3.56, SD = 0.58), while Duration of Time Spent recorded the lowest mean (M = 3.40, SD = 0.60).

Table 1

Summary Table of the Level of Artificial Intelligence-Assisted Learning

Artificial Intelligence-Assisted Learning	Mean	Interpretation	SD
Frequency of Using AI Tools	3.56	High	0.58
Time Spent Using AI Tools	3.40	Moderate	0.60
Variety of Learning Activities Using AI	3.78	High	0.52
Overall	3.58	High	0.57

Note. Scale: 1.00–1.80 = Very Low; 1.81–2.60 = Low; 2.61–3.40 = Moderate; 3.41–4.20 = High; 4.21–5.00 = Very High

The prominence of variety over duration reflected a shift toward task-oriented technology use, where AI served as an on-demand academic assistant rather than a constant study companion. Students appeared to rely on AI for specific functions such as clarifying difficult readings, generating ideas, and verifying information. Research on AI-supported learning noted that learners prioritize efficiency and relevance when using intelligent tools, often engaging with them briefly to address immediate academic needs rather than sustaining long-term interaction (Alam & Mohanty, 2023). The moderate level observed in time spent using AI tools suggested a balanced digital behavior, aligning with models of self-regulated learning wherein learners strategically selected tools that enhanced performance without diminishing cognitive engagement (Kumar et al., 2023).

In terms of classroom implementation, these findings would suggest that teachers might consider guiding students towards more substantive uses of AI by incorporating reading activities that emphasize analysis and evaluation, as well as synthesis of arguments from multiple texts. Rather than letting AI use remain incidental and student-directed, teachers could strategically design lesson plans that integrate higher-order thinking tasks with explicit instruction. Curriculum writers might decide to redevelop existing units in reading with sections of guided AI use – for instance, requiring students to compare arguments and perspectives across multiple texts or evaluating to what degree a comparison made by an AI is highlighted in the different texts. For school leaders, the implications of these findings suggest the need to also establish clear instructional policies for AI use in the classroom, as well as invest resources in professional development programs that allow for teachers to develop their pedagogical proficiencies regarding ethical and effective AI integration. Policymakers at the division and national levels might likewise employ these findings in developing acceptable use frameworks for digital literacy that capture appropriate expected use(s) of AI automated technologies within the curriculum for senior high school students.

2. Level of Digital Distractions:

Table 2 presents the results on digital distractions across the two measured dimensions. The findings showed an overall mean of 3.76, interpreted as High, with a standard deviation of 0.62. Push Distractions obtained the highest mean score (M = 3.77, SD = 0.62), followed closely by Habit Distractions (M = 3.75, SD = 0.62).

Table 2

Summary Table of the Level of Digital Distractions

Digital Distractions	Mean	Interpretation	SD
Push Distractions	3.77	High	0.62
Habit Distractions	3.75	High	0.62
Overall	3.76	High	0.62

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Note. Scale: 1.00–1.80 = Very Low; 1.81–2.60 = Low; 2.61–3.40 = Moderate; 3.41–4.20 = High; 4.21–5.00 = Very High

The very close clustering of mean values suggested that both externally triggered interruptions and automatic checking behaviors occurred at comparable levels. Studies on attention and technology explained that externally triggered interruptions fragmented focus and reduced task persistence (Lekaj & Orehovački, 2025). At the same time, the high level of habit distractions indicated that repeated digital behaviors had become embedded in students' routines, reinforcing automatic checking patterns even without direct prompts (Chen et al., 2020). These findings underscored the need for structured instructional guidance and digital wellness education that helped learners develop sustained attention and healthier patterns of technology use.

The teachers' challenge is both a push and a habit from an instructional standpoint. Finding opportunities in curriculum to engage students in protocols for focused reading – during which attention is practiced and built – could be one way English and reading teachers help students read more deeply with hypertext sources**.** Potential strategies include device-free reading periods, immediate reading comprehension assessments, and tools for metacognitive journaling to track shifts of attention between text and technology. Curriculum designers may want to embed digital wellness skills into the senior high school English and Media and Information Literacy strands. If reading and comprehension skills are to be instilled through instruction, so should self-awareness skills that help students strategize around distractions. The distraction level reported here may also help school administrators gather evidence in favor of district policy review and inclusion of classroom level phone management, as in recommendations around restricting phone-based work during instruction hours. Teacher education may aim to integrate digital distraction awareness into pre-service preparation so that future teachers can design learning environments that address attention disruptions as an avenue for better attention.

3. Level of Metacognitive Reading Strategies:

Table 3 presents the consolidated results for metacognitive reading strategies. The findings showed a weighted mean of 4.05, interpreted as High, with a standard deviation of 0.55. Among the three dimensions, Monitoring obtained the highest mean score (M = 4.16, SD = 0.55), followed by Evaluating (M = 4.02, SD = 0.57) and Planning (M = 3.98, SD = 0.52).

Table 3

Summary Table of the Level of Metacognitive Reading Strategies

Metacognitive Reading Strategies	Mean	Interpretation	SD
Planning	3.98	High	0.52
Monitoring	4.16	High	0.55
Evaluating	4.02	High	0.57
Overall	4.05	High	0.55

Note. Scale: 1.00–1.80 = Very Low; 1.81–2.60 = Low; 2.61–3.40 = Moderate; 3.41–4.20 = High; 4.21–5.00 = Very High

The prominence of monitoring highlighted students' strong engagement in real-time comprehension checking while reading. Literature on skilled reading identified monitoring as a defining feature of proficient readers, as it allowed continuous assessment of understanding and immediate use of repair strategies when difficulties arose (Afflerbach, 2025). The slightly lower mean for planning compared to monitoring and evaluating reflected a common pattern in secondary learners, where in-process and post-reading strategies were applied more consistently than pre-reading strategies unless explicitly reinforced through instruction (Huang & Lajoie, 2021). The consistently low standard deviation values across all dimensions indicated strong agreement among participants regarding the importance and use of metacognitive reading strategies.

These findings have several implications for instructional design and classroom practice. Because planning had the lowest mean of the three metacognitive dimensions, teachers might consider devoting particular attention to explicit instruction before students embark on any difficult reading task. Specifically, instruction should focus on strategies to induce planning behavior, such as setting a purpose, analyzing text features, or activating background knowledge. Programs that embed a quick routine for pre-reading into each day's reading lesson should help students

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to approach complex reading materials strategically, particularly those involving arguments from several points of view. Units might incorporate details about the use of metacognitive strategy frameworks – such as planning-monitoring-evaluating outlines – into lesson plan templates and reading program descriptions across Grade 12 subject areas. For school administrators and department heads, the high level of reported metacognitive strategy use suggests that existing reading initiatives have established a functional foundation for student self-regulation. Nevertheless, targeted professional development could further refine these practices to maximize their impact on student performance. Furthermore, these results provide a framework for teacher education institutions to design curricula that emphasize the explicit modeling and scaffolding of all three metacognitive phases, with a particular emphasis on strengthening the planning dimension.

4. Level of Critical Reading Skills:

Table 4 presents the summary of critical reading skills across three dimensions. The results showed an overall mean score of 3.85, interpreted as Fair, with a standard deviation of 0.98. Evaluating Information Gathered from Text obtained the highest mean score (M = 5.00, Very Good), followed by Analyzing Complex Arguments (M = 3.30, Fair) and Synthesizing Author's Intentions (M = 3.22, Fair).

Table 4

Summary Table of the Level of Critical Reading Skills

Critical Reading Skills	Mean	Interpretation	SD
Analyzing Complex Arguments	3.30	Fair	0.90
Evaluating Information Gathered from Text	5.00	Very Good	1.10
Synthesizing Author's Intentions	3.22	Fair	0.95
Overall	3.85	Fair	0.98

Note. Scale: 1.00–1.80 = Very Poor; 1.81–2.60 = Poor; 2.61–3.40 = Fair; 3.41–4.20 = Good; 4.21–5.00 = Very Good

The *Fair* mean scores in analyzing complex arguments and synthesizing author's intentions reflected the cognitive demands of these skills. Analyzing arguments required identifying claims, examining evidence, recognizing logical relationships, and evaluating assumptions, while synthesis involved integrating ideas across a text to infer authorial purpose and perspective. Literature on critical literacy emphasized that these skills were among the most demanding reading processes and required sustained instruction and guided practice to develop effectively (Minor & Muhammad, 2023). The relatively good performance in evaluating information suggested that students possessed foundational evaluative abilities, likely reinforced by classroom emphasis on fact-checking and source evaluation (Addy, 2020).

These findings provide significant implications for the design of reading instruction for senior high school students. The persistent *Fair* performance in argument analysis and synthesis suggests that existing reading tasks may not provide students with sufficient engagement with complex, multi-layered texts that present diverse and often contradictory perspectives. To address this, teachers could implement instructional strategies – such as Socratic discussions, annotated reading exercises, and cross-textual comparisons – that require students to not only evaluate information but also construct and defend their own interpretations of a text. Furthermore, curriculum designers should review the sequencing of critical reading within the senior high school English curriculum to ensure that analytical and synthetic skills are integrated systematically rather than incidentally. The discrepancy between the students' proficient performance in evaluating information and their lower scores in synthesis and argument analysis suggests that a shift in instructional focus is warranted, building upon their existing evaluative strengths. For school administrators, these results provide an empirical basis for prioritizing reading programs that move beyond foundational literacy toward the higher-order dimensions of critical reading. This is particularly urgent given that international assessments, such as PISA, continue to identify these specific areas as significant challenges for Filipino learners.

5. Influence of AI-Assisted Learning, Digital Distractions, and Metacognitive Reading Strategies on Critical Reading Skills:

Table 5 presents the results of the multiple regression analysis. The regression model was statistically significant, $F(3, 257) = 6.04$, $p < .001$, indicating that the predictors collectively contributed to explaining variation in critical reading performance, thereby rejecting the null hypothesis H_{04}. The model yielded an R^2 value of 0.066 and an adjusted R^2 of 0.055, indicating that approximately 5.5% of the variance in critical reading skills was explained by the three predictor variables.

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Table 5

Regression Analysis of AI-Assisted Learning, Digital Distractions, and Metacognitive Reading Strategies on Critical Reading Skills

Predictor	Unstandardized Coefficients		β	95% CI		t	p
	B	SE		Lower	Upper		
Constant	18.68	2.30		14.15	23.21	8.124**	<.001
AI-Assisted Learning	-0.24	0.44	-0.034	-1.11	0.64	-0.535	0.593
Digital Distractions	-0.35	0.44	-0.052	-1.22	0.52	-0.790	0.430
Metacognitive Reading Strategies	1.97	0.47	0.270	1.06	2.89	4.235**	<.001
Model Summary							
R = 0.257	R^2 = 0.066	Adjusted R^2 = 0.055	F(3,257) = 6.04*	p<.001			

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: C = 1.97M + 18.68;
C = Critical Reading Skills, M = Metacognitive Reading Strategies

Examination of individual predictors showed that metacognitive reading strategies emerged as the only significant predictor of critical reading skills (B = 1.97, t = 4.235, p < .001), indicating that a one-unit increase in metacognitive reading strategies corresponded to a 1.97-unit increase in critical reading skills. Extensive research on reading comprehension identified metacognitive regulation – particularly planning, monitoring, and evaluating – as a central mechanism supporting analysis, evaluation, and synthesis of textual information (Kökçü, 2023). Accordingly, the null hypothesis H_{03} was rejected.

These findings have implications for instructional practice. For teachers, the strength of metacognitive reading strategies as a predictor reinforces the case for grounding explicit strategy instruction into regular reading lessons. Instead of allowing incidental or assumed metacognitive application, teachers should model strategy use, provide guided practice on difficult texts, and design tasks that reward students for using strategies as both a process and a goal of a successful final product. For developers of curriculum, these results can be used as rationale for including metacognitive reading instruction into senior high school English curriculum guides and learning competencies developed for use across the grade level, ensuring that metacognitive reading instruction is scaffolded to progressively different learning levels as appropriate to the successful use of the strategy. School leaders would be able to write into their budget the high cost of professional learning communities and faculty development in metacognitive reading practices to study and integrate strategies and embed them into classroom use. Teacher education programs may also convert this study into justification for additional reading strategy instruction for preservice lessons, especially for English and content area teachers that would be working with the high school population.

In contrast, AI-assisted learning did not demonstrate a statistically significant contribution to critical reading skills (B = −0.24, p = 0.593). Earlier findings indicated that AI was primarily utilized for surface-level academic support such as information retrieval and idea generation rather than for sustained engagement with complex texts. Literature on educational technology consistently reported that technology use did not directly improve higher-order skills unless explicitly aligned with instructional goals requiring analysis, evaluation, and synthesis (Akintayo et at., 2024). Consequently, the null hypothesis H_{01} could not be rejected.

Similarly, digital distractions did not show a statistically significant influence on critical reading skills (B = −0.35, p = 0.430). Critical reading skills represented relatively stable cognitive competencies that developed over time through instruction and practice rather than being immediately affected by situational factors such as momentary distractions. Prior descriptive findings in this study showed high levels of monitoring and evaluating strategies among participants, which appeared to buffer the potential impact of distractions on comprehension and interpretation (Adams et al., 2025). The null hypothesis H_{02} could not be rejected. Regarding digital wellness, while distractions did not prove to be significant statistical direct predictors in the model, their reported high levels give concern for long-term academic consequences of technology use for work or study. Teachers and school administrators are encouraged to see this as an indication that well-developed Metacognitive Reading Strategy Instruction may offer protection, again reinforcing the need to orient to strategy instruction as both a literacy and self-regulation need. Policy makers preparing digital

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wellness programs may consider framing "the distraction problem" not merely as a behavioral issue but as a learning challenge best addressed through the development of internal student resources and situational controls.

Conclusions

The study concluded that the effective development of critical reading skills in senior high school was shaped less by technological exposure and environmental conditions and more by how learners were guided to engage cognitively and strategically with texts. From a Constructivist perspective (Piaget, 1972; Vygotsky, 1978), learning tools—including artificial intelligence—became meaningful only when embedded within instructional contexts that promoted active sense-making, guided interaction, and purposeful engagement.

Viewed through the lens of Cognitive Load Theory (Sweller, 1988), digitally rich environments did not inherently diminish students' capacity for higher-order reading when instructional structures supported focused engagement. Most importantly, in alignment with Metacognitive Theory (Flavell, 1979), effective critical reading instruction required the explicit modeling and reinforcement of planning before reading, monitoring during reading, and evaluation after reading.

The study contributes to educational practice by emphasizing the importance of strategy-centered instruction in improving reading outcomes. It provides insights for teachers in designing metacognitive-based reading instruction, for curriculum developers in embedding higher-order literacy skills in learning materials, and for school leaders in supporting professional development focused on critical reading pedagogy. Overall, the findings reinforce the need for pedagogical innovation that integrates technology with cognitive and metacognitive strategies to enhance student learning.

Recommendations

Based on the conclusions of this study, the following recommendations are proposed.

1. Students may strengthen their critical reading skills by consistently applying metacognitive strategies such as planning before reading, monitoring comprehension during reading, and evaluating understanding after reading.
2. English teachers may enhance instruction by explicitly modeling metacognitive and critical reading strategies and by designing learning tasks that promote analysis, evaluation, and synthesis while integrating AI tools in a pedagogically meaningful way.
3. School administrators may support instructional improvement by providing professional development programs focused on metacognitive strategy instruction and by establishing clear guidelines for the ethical and effective use of AI in learning.
4. Curriculum developers may consider integrating structured metacognitive strategy instruction and higher-order reading tasks into curriculum guides and instructional materials to strengthen students' critical literacy skills.
5. Education policymakers may use the findings to inform policies that promote balanced technology integration and the development of higher-order thinking skills in secondary education.
6. Teacher education institutions may incorporate training on metacognitive reading strategies and responsible AI use into pre-service and in-service teacher education programs.
7. Future researchers may extend this line of inquiry by examining the depth and quality of AI-assisted learning practices and by conducting experimental studies on interventions targeting higher-order reading skills.

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