

Gender and Academic Program Differences in Metacognitive Online Reading Strategies Among EFL University Students

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Abstract: Metacognitive online reading strategies are essential for helping English as a Foreign Language (EFL) students comprehend digital texts in higher education. However, studies investigating differences in these strategies based on gender and academic program among Indonesian EFL students remain limited. This study aimed to investigate the metacognitive online reading strategies employed by EFL students and examine whether significant differences existed based on gender and academic program. This study employed a descriptive quantitative survey design using a 15-item adapted version of the Online Survey of Reading Strategies (OSORS). The instrument demonstrated high reliability (Cronbach's Alpha = .892). A total of 223 students (51 males and 172 females) from eight study programs participated in the study. Data were analyzed using descriptive statistics, the Mann-Whitney U test, and the Kruskal-Wallis H test. The findings revealed that Problem-Solving Strategies were the most frequently used ($M = 4.14$), followed by Global Strategies ($M = 3.90$) and Support Strategies ($M = 3.80$), all classified as high-use strategies. Significant gender differences were found in Problem-Solving Strategies ($U = 3567$, $p = .042$) and Support Strategies ($U = 3343$, $p = .010$), with female students demonstrating higher strategy use, whereas no significant difference was found for Global Strategies. Furthermore, no significant differences were identified among the eight academic programs for any strategy category ($p > .05$). In conclusion, metacognitive online reading strategies are influenced by gender but not by academic program, indicating that these strategies function as general academic literacy skills across disciplines. These findings support the integration of metacognitive reading strategy instruction into EFL higher education to enhance students' digital reading competence.

Keywords: Academic Program, EFL, Gender differences, Metacognitive strategies.

INTRODUCTION

Reading is widely recognized as one of the most essential academic skills for students in higher education, particularly for those learning English as a Foreign Language (EFL) (Mahmood 2022). Ideally, EFL students are expected to comprehend various academic texts effectively to support their learning and research activities. However, in reality, many students still struggle to process complex texts, especially in digital environments where reading requires not only linguistic competence but also the ability to navigate, evaluate, and integrate information from multiple online sources (Ningsih, Weganofa, and Mafulah 2023). The rapid development of digital technology has transformed reading practices

from traditional print-based activities into dynamic online engagements. Students now rely heavily on digital materials such as e-journals, online articles, and academic databases (Yusof 2021). This shift increases the cognitive demands of reading, as students must deal with non-linear texts, hyperlinks, and information overload. Consequently, successful online reading is no longer solely determined by language proficiency, but also by the reader's ability to regulate and manage their own comprehension processes (Habók, Oo, and Magyar 2024; Freihat 2022).

In this context, metacognitive reading strategies become crucial. These strategies involve readers' awareness and control over their reading processes, including planning, monitoring, and evaluating comprehension. Students who

effectively employ metacognitive strategies tend to achieve better reading outcomes, particularly in complex online environments (Subramaniam et al. 2024). Ideally, EFL students at the tertiary level should demonstrate a high level of metacognitive awareness when engaging with digital texts (Harimurti, Basthomi, and Zen 2023). However, classroom observations and previous studies suggest that students' strategy use is often inconsistent and varies across individuals. Empirical research on metacognitive online reading strategies has shown growing interest, yet studies focusing on Indonesian EFL students remain limited (Abdullah and Ismail 2025). One notable study by Rianto (2021) revealed that students generally used metacognitive strategies at a moderate to high level, with support strategies being the most frequently used and global strategies the least. Despite its contribution, the study did not examine how individual learner characteristics influence strategy use. This limitation highlights a critical research gap, as factors such as gender and academic background may play an important role in shaping students' reading behaviors.

In the context, this issue becomes more significant due to the diversity of students across eight study programs, each with different academic demands and levels of exposure to English. Gender differences may also influence strategy use, as previous studies have indicated variations in learning strategies between male and female students (Dika, Jafar, and Mahmud 2021). Without understanding these differences, instructional practices may fail to address students' specific needs effectively. Therefore, this study aims to investigate the metacognitive online reading strategies used by EFL students, with a particular focus on differences based on gender and study program. By examining these characteristics, this study seeks to provide more nuanced insights into students' reading behaviors and contribute to more targeted and effective EFL instruction in higher education.

Research Questions:

1. What metacognitive online reading strategies are most and least frequently used by EFL students?
2. Is there a significant difference in the use of metacognitive online reading strategies between male and female students?

Is there a significant difference in the use of metacognitive online reading strategies among

students from different study programs? Provides a context or background of the study, that is the gap between the expected and actual condition, supported by the latest theories and studies relevant to the problem, and the new value of research which is innovation. This section should not exceed 20% of the body of the article.

METHODS

Research Design

This study employs a descriptive quantitative research design using a survey method. Descriptive quantitative research aims to systematically describe phenomena using numerical data without manipulating variables (Creswell and Creswell 2017). This design was considered appropriate because the study sought to identify and compare the use of metacognitive online reading strategies among EFL students based on gender and study program.

Research Setting

This study was conducted at the English Education Department, Faculty of Tarbiyah and Teacher Training, State Islamic University of Palangka Raya, Indonesia. The data collection was carried out in May 2026 through an online survey administered via Google Forms.

Population and Sample

The population of this study consisted of undergraduate students enrolled in the English Education Department of UIN Palangka Raya. A total of 223 valid responses were obtained, comprising 51 male and 172 female students from eight different study programs. The participants were selected using convenience sampling because they were readily accessible during the data collection period and voluntarily agreed to participate in the study.

Research Instrument

Data are collected using a survey questionnaire administered through Google Form. The instrument used in this study is the Online Survey of Reading Strategies (OSORS) developed by (Anderson 2003) and adapted in the Indonesian context by (Rianto 2021). The instrument measures students' use of metacognitive online reading strategies. To avoid survey fatigue and ensure that the instrument was easily comprehensible to early-semester students, the instrument was adapted into a Short Form Questionnaire consisting of 15 items. The items

were proportionally divided into three main constructs: 5 items for Global Strategies, 5 items for Problem-Solving Strategies, and 5 items for Support Strategies. Respondents were asked to respond to each statement using a 5-point Likert scale, ranging from 1 (Never) to 5 (Always). Mean score interpretation followed the (Richards and Renandya 2002) scale: high use (3.5–5.0), moderate use (2.5–3.4), and low use (1.0–2.4).

Validity and Reliability

Prior to the main data collection, the validity and reliability of the Online Survey of Reading Strategies (OSORS) were evaluated to ensure the consistency and accuracy of the instrument. A reliability test was conducted to measure the internal consistency using Cronbach's Alpha coefficient. The statistical analysis revealed an overall Cronbach's Alpha score of 0.892 for the 15 items. Because the score significantly exceeds the standard acceptable threshold of 0.80, the questionnaire which encompasses Global, Problem-Solving, and Support strategy categories was deemed highly reliable and consistent for measuring the students' metacognitive online reading strategies.

Data Collection Procedure

The data collection was systematically conducted at the Faculty of Teacher Training. After obtaining formal permission, the researchers distributed the questionnaire to the target participants using an online survey platform (Google Forms). The survey link was disseminated through students' academic communication channels, primarily WhatsApp groups, to ensure broad accessibility. Before participating, students were provided with a brief explanation of the study's objectives, and informed consent was obtained, guaranteeing the anonymity and confidentiality of their responses. The collected data were subsequently curated and exported into a spreadsheet for statistical evaluation.

Data Analysis

The quantitative data obtained from the questionnaire were analyzed using the Jeffrey's Amazing Statistics Program (JASP) software. Prior to conducting inferential statistics, a Shapiro-Wilk test was administered to evaluate the normality of the data distribution. The assumption check indicated that the data significantly deviated from a normal distribution ($p < .001$). Consequently, non-parametric statistical procedures were adopted to ensure robust results.

The data analysis was divided into three primary stages to address the research questions:

Descriptive Statistics: To answer the first research question regarding the most and least frequently used metacognitive online reading strategies, descriptive statistics were calculated. The Mean (M) and Standard Deviation (SD) were generated for both the strategy categories and specific items to rank their frequency of use.

Mann-Whitney U Test: To address the second research question concerning the differences in strategy use between male and female students, a Mann-Whitney U test a non-parametric alternative to the Independent Samples T-Test was utilized. **Kruskal-Wallis H Test:** To answer the third research question regarding the variance in strategy use among the students across the eight different study programs, a Kruskal-Wallis H test (the non-parametric equivalent of the One-Way ANOVA) was employed. For all inferential statistical analyses in this study, the significance level was predetermined at $\alpha = .05$.

FINDINGS AND DISCUSSION

Metacognitive Online Reading Strategies Used by EFL Students

The first research question aimed to identify the metacognitive online reading strategies most and least frequently used by EFL students. Table 1 presents the descriptive statistics for all three strategy categories as measured by the Online Survey of Reading Strategies (OSORS).

Table 1. Descriptive Statistics of Metacognitive Online Reading Strategies Used by EFL Students

Reading Strategy Categories	N	Mean	SD	Rank
Problem-Solving Strategies	223	4.14	0.67	1
Global Reading Strategies	223	3.90	0.69	2
Support Reading Strategies	223	3.80	0.72	3

Note. SD = Standard Deviation. Strategy categories ranked by mean score.

As shown in Table 1, Problem-Solving Strategies emerged as the most frequently used category (M

$= 4.14$, $SD = 0.67$), followed by Global Reading Strategies ($M = 3.90$, $SD = 0.69$), and Support

Reading Strategies ($M = 3.80$, $SD = 0.72$). According to Oxford's (1990) frequency categorization, all three categories fall within the high range (Mean ≥ 3.50), indicating that the 223

EFL students in this study consistently employed metacognitive strategies when engaging with online texts.

Table 2. The Most and Least Frequently Used Online Reading Strategies

Item	Strategy Description	Category	Mean	SD
<i>Most Frequently Used</i>				
PS3	I reread the difficult parts to make sure I understand them.	Problem-Solving	4.422	0.749
PS1	I read more slowly and carefully when the text feels difficult to understand.	Problem-Solving	4.314	0.901
S1	I use a dictionary to look up the meaning of words I do not know.	Support	4.197	0.938
<i>Least Frequently Used</i>				
S5	I read difficult parts of the text aloud to help me understand them.	Support	3.547	1.233
S2	I make small notes, underline, or mark important information while reading.	Support	3.691	1.022
G1	I have a clear goal in mind before I start reading the text	Global	3.780	1.053

Note. Strategy items coded by category prefix: PS = Problem-Solving; G = Global; S = Support.

A closer examination of individual items, as presented in Table 2, reveals further nuances in students' strategy use. Among the most frequently used strategies, PS3 ("I reread the difficult parts to make sure I understand them") recorded the highest mean score ($M = 4.422$, $SD = 0.749$), followed by PS1 ("I read more slowly and carefully when the text feels difficult to understand"; $M = 4.314$, $SD = 0.901$). These results suggest that students tend to actively monitor their comprehension and apply fix-up strategies when encountering difficulties. In contrast, the least frequently used strategy was S5 ("I read difficult parts of the text aloud to help me understand them"; $M = 3.547$, $SD = 1.233$), a

Support strategy that involves verbal articulation as an external aid.

Differences in Metacognitive Online Reading Strategies Based on Gender

The second research question investigated whether there was a significant difference in metacognitive online reading strategy use between male and female students. Given that the normality assumption was not met for all strategy categories, the Mann-Whitney U test was applied as a non-parametric alternative to the independent-samples t-test. The results are presented in Table 3.

Table 3. Differences in Metacognitive Online Reading Strategies Based on Gender

Reading Strategies	Gender	N	Mean	SD	U	p	Sig.
Global Strategies	Male	51	3.89	0.67	4237	.712	ns
	Female	172	3.90	0.70			
Problem-Solving	Male	51	3.98	0.73	3567	.042	*
	Female	172	4.19	0.66			
Support Strategies	Male	51	3.60	0.74	3343	.010	*
	Female	172	3.86	0.72			

Note. * $p < .05$. SD = Standard Deviation. ns = not significant.

As displayed in Table 3, statistically significant differences between male and female students were found in Problem-Solving Strategies ($U = 3567$, $p = .042$) and Support Strategies ($U = 3343$, $p = .010$), with female students reporting higher mean scores in both categories (Problem-Solving: $M_{\text{female}} = 4.19$ vs.

$M_{\text{male}} = 3.98$; Support: $M_{\text{female}} = 3.86$ vs. $M_{\text{male}} = 3.60$). In contrast, no statistically significant difference was observed for Global Strategies ($U = 4237$, $p = .712$), where both groups reported nearly identical mean scores.

Differences in Metacognitive Online Reading Strategies Across Study Programs

The third research question sought to determine whether significant differences existed in the use of metacognitive online reading strategies among students enrolled in eight distinct academic programs within a teacher training faculty. Prior to inferential analysis, a

Shapiro-Wilk test was conducted, which revealed that the data across groups were not normally distributed ($p < .001$). Consequently, a Kruskal-Wallis H test a rank-based non-parametric alternative to one-way ANOVA was employed to compare the median strategy scores across the eight independent programs.

Table 4. Kruskal-Wallis Test Results for Reading Strategies Across Eight Study Programs

Reading Strategy Categories	N	df	Kruskal-Wallis H	p	Decision	Sig.
Global Reading Strategies	223	7	5.542	.594	Not Significant	ns
Problem-Solving Strategies	223	7	2.647	.916	Not Significant	ns
Support Reading Strategies	223	7	8.735	.272	Not Significant	ns

Note. The significance level is set at $p < .05$. ns = not significant.

For Global Reading Strategies, the Kruskal-Wallis test revealed no statistically significant difference among students from the eight study programs, $H(7) = 5.542$, $p = .594$. For Problem-Solving Strategies, the analysis similarly yielded no significant variance across the different study programs, $H(7) = 2.647$, $p = .916$. Finally, the examination of Support Reading Strategies also demonstrated no significant difference across the study programs, $H(7) = 8.735$, $p = .272$. Because all overall Kruskal-Wallis tests indicated non-significant results ($p > .05$), post hoc analyses (e.g., Dunn’s test) were not required. The complete statistical summary is presented in Table 4.

The Predominance of Problem-Solving Strategies in EFL Online Reading

The findings of the first research question demonstrate that Problem-Solving Strategies were the most frequently employed metacognitive strategies among EFL students when engaging with online texts. This outcome is largely consistent with previous research in EFL contexts. The predominance of Problem-Solving Strategies aligns with (Wallace et al. 2021), who found that EFL learners tend to prioritize strategies that directly address comprehension breakdowns. This tendency reflects a reactive, difficulty-driven approach to reading, whereby students activate strategies primarily in response to textual challenges rather than as part of a pre-planned reading (Ryandini, Utomo, and Daristin 2025).

The relatively lower use of Support Strategies, particularly those involving external tools such as dictionaries or verbal repetition, may reflect students’ growing confidence in their own comprehension abilities, or alternatively, a lack of awareness regarding the benefits of auxiliary

resources in online reading contexts (Satriani 2017; Mekheimer 2025). Notably, the dominance of Problem-Solving Strategies in this study contrasts with Rianto (2021) finding that Support Strategies were the most frequently used among Indonesian EFL students. This discrepancy may be attributed to differences in participants’ study programs and levels of digital reading experience, as the current sample spans eight academic disciplines, some of which impose higher academic reading demands that may encourage more sophisticated strategy deployment.

These findings suggest that EFL students in this study possess a relatively developed metacognitive awareness. Nevertheless, targeted instruction in Global and Support Strategies may further enhance their reading effectiveness across diverse digital text types. Instructors are therefore encouraged to design activities that explicitly scaffold planning-oriented (global) and resource-based (support) reading behaviors in digital environments.

Gender-Based Differences in Metacognitive Online Reading Strategy Use

The findings of the second research question partially support the hypothesis that gender influences metacognitive reading strategy use in online environments. The significant differences observed in Problem-Solving and Support Strategies indicate that female students are more likely to engage in strategies such as rereading, adjusting reading pace, and utilizing external resources when encountering comprehension difficulties. This pattern is consistent with the broader literature on gender and language learning strategies, which suggests that female learners tend to employ a wider repertoire of strategies, particularly those

involving monitoring and resource management (Deliany and Cahyono 2020; Wallace et al. 2021; Ghadamgahi and Ghafournia 2024).

The absence of a significant gender difference in Global Strategies aligns with findings reported by (Nurisma and Basthomi 2025), who argued that higher-order planning strategies may be less sensitive to gender variation, as they are more closely tied to academic socialization and reading instruction than to individual learner characteristics. The observed gender gap in Support and Problem-Solving Strategies may reflect differences in metacognitive sensitivity, whereby female students demonstrate greater attentiveness to comprehension monitoring and a higher readiness to seek assistance when facing difficulties (Ahmadian 2017).

These findings carry practical implications for EFL instruction. Male students may benefit from more explicit guidance in activating fix-up and support strategies, while instruction in global reading planning may be developed uniformly across gender groups. Future research may also explore whether these differences persist across varying levels of text difficulty and digital literacy competence.

The Homogeneity of Online Reading Strategies Across Academic Disciplines

The statistical findings for the third research question revealed a compelling pattern of homogeneity: there is no significant difference in the use of metacognitive online reading strategies among students from the eight distinct academic programs. Whether students belong to the English Education Department, Islamic Education, Mathematics Education, or other academic majors, their frequency and preference in utilizing global, problem-solving, and support strategies remain fundamentally similar. This non-significant variance offers several important pedagogical and institutional insights.

First, this uniformity can be substantially attributed to the shared academic ecosystem and institutional culture within the Faculty of Teacher Training. Despite their distinct disciplinary focuses, all teacher candidates in this faculty are subject to similar baseline academic literacy demands. The university curriculum requires all students to engage with digital learning platforms, online academic journals, and e-learning modules, thereby compelling them to develop a universal set of digital reading competencies. This finding

aligns with the notion that academic reading in higher education particularly in the digital era demands a generic repertoire of metacognitive skills that transcends specific disciplinary boundaries (Subramaniam et al. 2024).

Second, the absence of differences across study programs suggests that metacognitive online reading strategies may function more as generalized “digital literacy” traits than as discipline-specific competencies (Koch and Fehlmann 2025). In an era where students consume information predominantly through digital screens, the cognitive approach to navigating digital texts such as adjusting reading speed (Problem-Solving) or utilizing online dictionaries (Support) has become a generalized cognitive habit, shared across academic contexts (James 2025).

It is critical, furthermore, to contrast this finding with the results of the second research question, which highlighted significant gender-based differences. While academic major (study program) did not yield any significant variance in strategy use, gender did. This contrast implies that the deployment of metacognitive strategies is more heavily influenced by individual demographic and psychological characteristics (such as gender-based learning dispositions) than by students’ academic departmental affiliation (Agrawal et al. 2025). It underscores that an individual’s approach to learning is not strictly compartmentalized by disciplinary membership (Karpenko et al. 2019).

From a pedagogical perspective, the lack of significant differences among study programs presents a practical advantage for institutional policymakers and educators at teacher training faculties. Because students across all eight programs exhibit similar patterns of strategy use and face comparable challenges, the faculty can design and implement standardized, faculty-wide reading intervention programs. Rather than developing highly differentiated online reading instructions for each specific major, a general academic literacy program focused on enhancing global reading awareness and digital support utilization would be equally beneficial for all teacher candidates across the faculty.

CONCLUSION

This study investigated the metacognitive online reading strategies used by 223 EFL students at a teacher training faculty, examining differences based on gender and academic

program. Three main conclusions can be drawn from the findings. First, all three strategy categories Problem-Solving, Global, and Support were employed at a high level, with Problem-Solving Strategies being the most frequently used ($M = 4.14$) and Support Strategies the least ($M = 3.80$). The prevalence of Problem-Solving Strategies suggests that students primarily activate metacognitive behaviors reactively, in response to comprehension difficulties, rather than proactively through planning. The most used individual strategy was rereading difficult parts (PS3, $M = 4.422$), while reading aloud for comprehension (S5, $M = 3.547$) was used least frequently. Second, gender significantly influenced the use of Problem-Solving ($U = 3567$, $p = .042$) and Support Strategies ($U = 3343$, $p = .010$), with female students reporting higher scores in both categories. No significant difference was found for Global Strategies. These results suggest that female students demonstrate greater metacognitive sensitivity, particularly in monitoring comprehension and utilizing resources when facing difficulties. In contrast, study program had no significant effect on any strategy category ($p > .05$), indicating that metacognitive online reading behaviors are generalized digital literacy skills shared across disciplines rather than discipline-specific competencies.

Based on these findings, several suggestions are offered. For EFL instructors, it is recommended to provide explicit instruction in Global and Support Strategies, particularly for male students who demonstrated lower scores in these areas. Gender-responsive reading pedagogy should be integrated into EFL classrooms to address observed differences. For institutional policymakers at teacher training faculties, the uniformity of strategy use across all eight study programs supports the development of a standardized, faculty-wide academic literacy program focused on digital reading competence. Future research should investigate the relationship between metacognitive strategy use and actual reading comprehension achievement, explore the role of digital literacy proficiency as a mediating variable, and examine whether these patterns hold across other faculties and Indonesian higher education institutions.

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