INVESTIGATING GENDER GAP IN METACOGNITIVE READING STRATEGY: UNEARTHING PRACTICAL CHALLENGES IN ONLINE EFL READING

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ABSTRACT

Despite the growing use of online reading in higher education, particularly among EFL learners, limited study has examined how students differ in their use of reading strategies and the specific challenges they face in online context. Most studies address online reading in general terms, but few examine gender-based perceptions and strategic behaviors in online environments. This study aims to fill the gap by examining the application of metacognitive strategies in online reading focusing on gender differences and the challenges students encounter. A mixed method was employed, involving 100 undergraduate students from non-English departments. Data were gathered using the Online Reading Strategies Inventory (ORSI) and open-ended questionnaires. Findings revealed that both male and female students reported moderate use of metacognitive strategies, with no significant difference in overall strategy selection. However, a gender-related gap was observed in the utilization of support strategies. Additionally, students identified several challenges, including limited engagement with digital features, low literacy skills, and a lack of effective strategy use. The results offer substantial pedagogical implications for English language teaching, emphasizing the need to address students' difficulties in online reading and to train them in diverse metacognitive strategies to strengthen their reading comprehension, particularly in online contexts.

INTRODUCTION

The shift toward digital education, especially after the pandemic, has intensified students' reliance on online reading platforms in higher education. The digital shift has revolutionized the way students' access, process, and interact with information. The growing accessibility of digital reading materials enables students to explore diverse sources of information, making it essential for them to develop effective skills for reading online text (Anderson, 2003). Online reading provides an extensive array of information in multiple formats, including eBooks, blogs, academic articles, learning resources, and social media entries. However,

navigating online texts presents a cognitively demanding task. It poses unique cognitive and metacognitive challenges that differ considerably from those associated with traditional print-based reading. Online reading demands a higher level of strategic engagement, as students must constantly monitor their comprehension, evaluate sources, and synthesize information from non-linear and multimodal formats. This includes navigating hyperlinks, interpreting infographics or embedded videos, and managing distractions from pop-ups or irrelevant links. As such, online reading demands more than just comprehension. It requires students to navigate, interpret, and integrate multimodal elements under greater cognitive load (Liao et al., 2024; Stiegler-Balfour et al., 2023). Despite this complexity, a common misconception persists: that students use similar strategies for both online and offline reading, and that online reading involves less strategic engagement due to its perceived superficiality. However, this assumption oversimplifies the mental processes required in navigating digital texts and ignores the distinct metacognitive challenges associated with digital reading (Naumann, 2023). Therefore, understanding the strategies students apply during online reading is crucial, particularly in how they monitor their reading comprehension in a digital learning environment.

Conceptually, metacognitive reading strategies are essential for effective reading, especially in EFL contexts (Artelt et al., 2001; Iswati & Frendy, 2022). Metacognitive strategies enable readers to regulate and oversee their comprehension process (Shoeorey & Mokhtari, 2001). To measure learner's metacognitive awareness, Mokhtari and Sheorey (2002) designed the Survey of Reading Strategy (SORS) specifically in EFL contexts. These strategies are generally categorized into three types, such as global reading strategies, problem-solving strategies and support strategies. Global strategies, such as determining what to read, focusing on textual features, and predicting the topic are usually applied to prepare for reading. Problem solving strategies are employed when readers encountered difficulties in understanding the text, including practices like rereading, revisiting earlier sections, or pausing for clarity. Meanwhile, support strategies such as highlighting key words, paraphrasing, or moving back and forth through the text are used to maintain comprehension and engagement during the reading process.

Among the various factors influencing language learning strategies, gender remains a key variable. Research suggests that female students often outperform males in language acquisition and reading tasks (Chiu & McBride-Chang, 2006; Lietz, 2006; Wightman, 2020). This performance gap is often attributed to differences in motivation, learning attitudes, and strategy repertoire. Moreover, female readers tend to show higher levels of reading motivation (Logan & Johnston, 2010, which in turn encourages them to adopt more deliberate and varied strategies. Motivated readers are more likely to engage in activities such as re-reading difficult sections, summarizing key ideas, or consulting additional sources—behaviors closely tied to metacognitive regulation. In contrast, male readers, while capable of strong comprehension, may exhibit less frequent use of such strategies, possibly due to lower intrinsic motivation or a preference for task-oriented approaches. These differences have implications for instructional design,

as fostering balanced strategy use across genders could enhance reading competence for all learners, particularly in online and blended learning contexts.

A substantial number of research have thoroughly investigated how gender affects the use of metacognitive reading strategies in comprehending reading materials (Alfarwan, 2021; Deliany & Cahyono, 2020; Khreisat, 2022; Rianto, 2021; Wallace et al., 2021; Wu, 2014). Many of these studies highlight that female readers often report higher frequency and quality of metacognitive strategy use, including global reading strategies (e.g., previewing and skimming), problem-solving strategies (e.g., inferring meaning from context), and support strategies (e.g., note-taking and using reference tools). Male readers, in contrast, are sometimes found to rely more on surface-level or less diversified strategies, though there are notable exceptions depending on task type and learning context. Much of this research (Alfarwan, 2021; Deliany & Cahyono, 2020; Khreisat, 2022; Wallace et al., 2021) highlights how males and females differ in their perceived and actual use of such strategies, particularly in offline reading contexts. While this body of research sheds light on gender-related patterns in traditional reading environments, little thought has been given to how these dynamics manifest in online reading settings. Only a few scholars (Pradita, 2020; Rianto, 2021) have explored the intersection between gender and metacognitive strategy use in digital platforms, and even then, the mental processes behind strategy selection and adaptation in online reading remain under-investigated.

Moreover, there is still a lack of clarity about how gender influences the application of metacognitive reading in digital environment, especially as online reading becomes more dominant in higher education. With the widespread integration of digital technologies into academic life, students increasingly encounter online texts that require affective and cognitive skill. Much of the existing literature focuses on students' general preferences for online reading, highlighting factors such as accessibility, cost-efficiency, portability, and availability of updated content (Chou, 2016; Milal et al., 2021). At the same time, there are concerns about online reading in academic contexts (Chou, 2016) including cognitive overload, distractions, and frustration especially when processing hyperlinked or multimodal content (Coiro, 2011).

These concerns underscore the need for deeper inquiry into how students cognitively process online texts. Online reading not only demands traditional comprehension skills but also requires learners to navigate, decode, and interpret multimedia elements which increase cognitive load. Gender plays a role in shaping students' attitudes toward digital technologies, with some studies (Schorr & Gorovoj, 2023; Wallace et al., 2021) suggesting that female students tend to be more critical of digital tools and may exhibit lower digital interest and engagement. However, other studies have found that female students' higher tendency to employ self-regulated learning strategies may counterbalance this lower interest, enabling them to achieve comparable or even superior comprehension outcomes compared to their male peers (Alfarwan, 2021; Wallace et al., 2021). Similarly, while male students may display greater initial enthusiasm toward technology, they might also be more prone to superficial reading approaches that focus on rapid scanning rather than deep comprehension.

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In the Indonesian context, the urgency of this investigation becomes even more pronounced. The national shift toward digital education has increased student dependence on online texts for academic purposes. Yet, there is limited empirical research exploring how Indonesian students engage with online texts through the lens of gender and metacognition. As online reading becomes embedded in Indonesia's higher education curriculum, understanding how students engage with online reading platforms and the specific challenges they face is vital for educators and policymakers aiming to improve reading instruction and academic support services. Indonesia's diverse linguistic and cultural background adds another layer of complexity, as many students operate in multilingual environments where English is not the primary medium of communication, further influencing their online reading strategies. In such contexts, metacognitive regulation may involve not only managing comprehension but also code-switching between languages, negotiating meaning, and adapting strategies to accommodate varying levels of English proficiency.

Given these complexities, the current study seeks to explore how EFL students across genders differ in their utilization of metacognitive strategies within online reading environments, and what challenges they face in doing so. Understanding these differences is crucial for informing pedagogical practices and supporting students' reading development in increasingly digital academic contexts. This also has implications for teacher training, as educators must be equipped with strategies to scaffold students' metacognitive skills, address gender-specific learning tendencies, and design digital reading activities that promote deeper engagement with texts rather than mere surface-level interaction.

In addition, this study investigates the factors that hinder students' reading performance, with a particular focus on the challenges experienced by undergraduate students when engaging with online texts. These challenges may stem from a combination of linguistic, cognitive, and technological factors, including limited vocabulary knowledge, insufficient digital literacy, and low awareness of effective reading strategies. Such issues can significantly influence students' ability to comprehend, analyse, and retain information when reading in a digital environment. Accordingly, the present research is guided by the following questions: how gender differences influence the selection of metacognitive strategies that impact online EFL reading, and how students perceive the challenges in online reading, particularly in relation to their use of reading strategies. Addressing these questions is crucial for identifying not only the patterns of strategy use across genders but also the barriers that may hinder reading comprehension in technology-mediated learning environments. The findings may inform the development of targeted pedagogical interventions aimed at enhancing students' metacognitive awareness, promoting access to effective strategies, and improving reading outcomes, particularly in online settings.

By addressing these questions, the research seeks to provide valuable implications for educators, policymakers, and curriculum developers aiming to enhance digital literacy and reading instruction in higher education. Ultimately, the findings are expected to inform the design of targeted interventions that support students' metacognitive development and help them overcome the

challenges of reading in increasingly digital academic contexts. The outcomes of this research may also serve as a foundation for developing digital literacy frameworks tailored to EFL learners, incorporating both gender-responsive pedagogy and culturally relevant instructional approaches. By integrating these findings into institutional policy, higher education in Indonesia can better prepare students to navigate the evolving demands of academic reading in a globalized digital environment.

RESEARCH METHOD
Research Design
A sequential explanatory mixed-methods approach was set up and carried out in two stages: an initial quantitative phase and a qualitative phase. The quantitative phase was carried out to obtain data on male and female students' utilization of metacognitive reading strategies in online contexts. This phase also provided descriptive statistical patterns for gender-based comparison. Following this, the qualitative phase aimed to explore the challenges students encountered when reading online. The data from both phases were integrated during the interpretation stage to enrich the overall analysis.

Setting and Participants
The participants included 100 undergraduate engineering students from a public university in Indonesia, selected through purposive sampling to ensure representation of both male and female EFL students who regularly engage in online reading tasks. The selection sought to examine potential gender differences in the use of metacognitive reading strategies among EFL learners. To ensure balanced representation and consistency in analysis, the sample was equally divided between 50 male (50%) and 50 female (50%) students, aged between 19 and 21 years.

Although the participants were from non-English majors, all had completed compulsory English courses and had substantial experience reading English texts online, such as e-books, research articles, and academic papers. The survey was distributed via online platforms, including social media groups, to reach a broader pool of participants. Students were notified that participation was optional and would not influence their academic performance.

Research Instruments
The primary instrument used to collect data was an online questionnaire developed using Google Forms. The questionnaire consisted of two sections: closed-ended items and open-ended items, developed to meet the research questions. The closed-ended section measured gender-based disparities in the uutilization of metacognitive reading strategies using the Online Reading Strategies Inventory (ORSI). This instrument, adapted from the Metacognitive Awareness of Reading Strategies Inventory (MARSI) by Sheorey and Mokhtari (2001), comprises 23 items classified into three categories: 9 items in Global Reading Strategies, 8 items in Problem-Solving Strategies, and 6 items in Support Strategies (see Appendix). The items were rated on a four-point Likert scale (1 = never, 4 = always) and were translated into *Bahasa Indonesia* to ensure participants fully understood the content. English versions of the questionnaire

items are presented in Tables 3, 4, and 5. Cronbach's alpha was calculated to confirm the instrument's reliability. The open-ended section was used to gather qualitative insights into the challenges students faced when engaging in online reading and how these related to their use of metacognitive strategies. These questions were also written in *Bahasa Indonesia* to encourage clearer and more detailed responses. The open-ended questions were formulated into two questions: first, what challenges do you usually face when reading online texts? and what strategies do you usually use to prepare yourself before reading an online text?

Data Collection

The questionnaire developed on the Google Form application was handed out with the aid of English lecturers who ordered the students to complete the form. The participants filled out the Likert-scale and open-ended questionnaire following class hours. The data collection technique involved categorizing the question items of the ORSI (Online Reading Strategies Inventory) instrument in the Likert-scale questionnaire. In the Likert-scale questionnaire, the students were instructed to select an answer from a four-point scale (1 = never, 2 = rarely, 3 = often, 4 = always). In the following stage, qualitative data were collected through students' responses to the open-ended questionnaire, aiming to identify common issues and challenges experienced during online reading. Students' names had been changed to initials P1, P2, P3, P4, etc. in order to ensure confidentiality.

Data Analysis

The information obtained from the Likert-scale questionnaire was quantitatively examined with descriptive statistics. To deal with the first research question, an independent samples t-test was applied to examine the mean differences in the utilization of metacognitive online reading strategies between male and female students. This parametric test was employed to assess whether gender influenced strategy usage in a statistically significant way. To interpret the mean scores, the study adopted the categorisation framework suggested by Mokhtari et al. (2018), which categorizes strategy use into three levels: if the mean score is above 3.50, it means that the strategy is used a lot. If it's between 2.5 and 3.4, it means that the strategy is used moderately or averagely, and if it is below 2.5, it means that it is used rarely. For the qualitative data, responses from the open-ended questionnaire were analyzed using thematic analysis. Similar responses were coded, categorized, and grouped into emerging themes. These categories were established by identifying patterns and distinctions within the data, following the approach suggested by Ezzy (2002). The final step involved interpreting the grouped data to generate meaningful insights into the students' perceived challenges in online reading.

FINDINGS AND DISCUSSION

Result of Quantitative Findings

This section presents the quantitative results obtained from 100 undergraduate students and addresses the first research question concerning gender-based differences in the uutilization of metacognitive online reading strategies. The analysis focuses on the three categories of strategy use, such as global reading strategies, problem-solving strategies, and support strategies. It

also reports the results of the independent samples t-test along with mean differences between male and female students.

Table 1 Group Statistics

	Gender	N	Mean	Std. Deviation	Std.Error Mean
Reading Strategies Use	Male	50	69.04	8.330	1.178
	Female	50	72.00	9.044	1.279

Descriptive statistics indicate that the male group had a mean score of 69.04 (SD = 8.33, SE = 1.178), whereas the female group had a slightly higher mean score of 72.00 (SD = 89.044, SE = 1.279). These values suggest that female students reported using metacognitive online reading strategies more frequently than their male counterparts, although the difference was relatively modest.

Table 2 Independent Sample Test

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Reading Strategies Use	Equal variances assumed	.599	.441	-1.702	98	.092	-2.960	1.739	-6.411	.491
	Equal variances not assumed			-1.702	97.344	.092	-2.960	1.739	-6.411	.491

As illustrated in Table 2, the p-value obtained was 0.092, with a significance level (α) set at 0.05 and a 95% confidence interval. Since the p-value exceeded the alpha level, the null hypothesis (H₀) was retained. This signifies that there was no statistically significant disparity in the average utilization of metacognitive online reading strategies between male and female students. In other words, gender did not appear to influence students' overall use of online reading strategies. According to the group statistics, the mean score for male students was 69.04, while female students scored a slightly higher mean of 72.00, suggesting a marginal difference in favor of the female group. To interpret the extent of strategy use, the current study adopted the categorization framework from Mokhtari et al. (2018), which classifies mean scores as follows: A high frequency of strategy use is indicated by scores exceeding 3.50, while a moderate level is indicated by scores around 2.5 and 3.4, below 2.5 reflect low frequency of use. Based on this classification, the observed mean scores in this study fall within the moderate strategy use range for both male and female groups.

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Table 3 Selection of Global Reading Strategies

Strategy Items	Mean Score		Items Description	Level	
	Male	Female		Male	Female
Global Item 1	3.37	3.27	I read online texts with a specific purpose or goal in mind.	medium	medium
Global Item 2	3.17	3.15	I evaluate if the online text is appropriate or relevant for my needs.	medium	medium
Global Item 3	2.7	2.94	I review the structure and length of the online text before reading.	medium	medium
Global Item 4	3.46	3.66	I use the internet to find information that supports my academic work.	medium	high
Global Item 5	2.97	3.27	I use visual text features such as bold print, italics, headings, colors, and fonts to identify key points.	medium	medium
Global Item 6	3.05	3.03	I analyze and assess the content of the text thoroughly.	medium	medium
Global Item 7	3.3	3.32	I make sure that I comprehend the new information presented in the text..	medium	medium
Global Item 8	3.14	3.26	I draw on my existing knowledge to aid in understanding the online material.	medium	medium
Global Item 9	2.98	3.22	I review the overall structure of the online text before beginning to read.	medium	medium
Average means	3.13	3.23		medium	medium

Table 3 shows that both male and female students reported a moderate overall use of global reading strategies when engaging with online texts, with mean scores of 3.13 for males and 3.23 for females. This indicates a relatively consistent application of strategic reading behaviors across genders. Female students consistently reported slightly higher use across most items. The highest-rated item for both groups was using the internet for academic reading (Item 4), while the lowest was examining text structure (Item 3). Notable gaps appeared in Items 3, 5, and 9, suggesting female students tend to be more attentive to text features and previewing. Overall, while strategy use was similar, females showed slightly stronger engagement with global reading strategies.

Table 4 Selection of Problem-Solving Strategies

Strategy Items	Mean Score		Items Description	Level	
	Male	Female		Male	Female
Problem Item 1	3.20	3.28	I read carefully and at a slow pace to better grasp the content.	medium	medium
Problem Item 2	3.30	3.42	I make an effort to refocus when I lose concentration while reading online.	medium	medium
Problem Item 3	3.24	3.06	I adjust how fast I read depending on the nature of the online material.	medium	medium
Problem Item 4	3.18	3.20	I am able to identify which parts of the text are important and which can be skipped.	medium	medium
Problem Item 5	3.18	3.40	I slow down and pay extra attention when the content is hard to understand.	medium	medium
Problem Item 6	3.20	3.22	I pause to reflect on what I've already read to ensure understanding.	medium	medium
Problem Item 7	3.32	3.24	I attempt to visualize any information from online text.	medium	medium
Problem Item 8	3.20	3.30	I move through the online text to revisit and connect information.	medium	medium
Average means	3.22	3.26		medium	medium

Table 4 shows that both male and female students reported a moderate level of strategy use, with overall mean scores of 3.22 for males and 3.26 for females. The highest mean score for females was in Item 2 ("I try to keep my attention when I fail to concentrate") at 3.42, while for males it was Item 7 ("I try to visualize or picture information") at 3.32. The lowest score for females was 3.06 in Item 3 (controlling reading speed), while males scored lowest in Item 5 (reading carefully when the text is difficult) at 3.18. Overall, both groups applied problem-solving strategies moderately, with female students slightly more consistent across items and male students showing strengths in visualizing and adjusting focus.

Table 5 Selection of Support Strategies

Strategy Items	Mean Score		Item Description	Level	
	Male	Female		Male	Female
Support Item 1	2.06	2.52	I print out the online material to allow space for note-taking..	low	medium
Support Item 2	2.42	2.76	I take notes while reading online to support my understanding of the text.	low	medium
Support Item 3	3.06	2.98	I utilize reference tools such as online dictionaries to interpret	medium	medium

			unfamiliar words.		
Support Item 4	2.38	2.60	I rely on visuals like images, mind maps, or charts to better grasp the content.	low	medium
Support Item 5	2.76	2.96	I occasionally rephrase the sentence	medium	medium
Support Item 6	2.40	2.94	I read the online text out loud when I find it hard to comprehend.	low	medium
Average means	2.51	2.79		low	medium

Table 5 indicates that female students used support strategies more frequently than male students, with an overall mean score of 2.79 (medium) compared to 2.51 (low) for males. The highest-rated item for both genders was Support 3 ("using reference links like dictionaries"), with scores of 3.06 (male) and 2.98 (female), both falling under medium use. The lowest mean score for males was in Support 1 ("printing texts to take notes") at 2.06 (low), while females scored 2.52 (medium). Female students consistently scored higher across all six support strategies. Males showed low use in 4 out of 6 items, suggesting less reliance on external aids, whereas females reported medium use in all strategies, reflecting greater engagement with supportive tools in online reading. Overall, the data suggests that support strategies are the least used among all strategy types, especially by male students.

Result of Qualitative Findings

In response to the increasing availability of online reading materials, many students reported difficulties in managing the complexity and unique features embedded in digital texts. Engaging with online content requires not only reading the written text but also processing visual and non-textual elements, which demands a higher level of active involvement and deeper cognitive processing. To navigate these demands effectively, students must apply appropriate reading strategies. While previous studies have highlighted generally positive student attitudes toward online reading, they also acknowledged that students often encounter various challenges. In the second phase of this research, data were collected through open-ended questions aimed at exploring students' perceptions of the challenges they face during online reading and how these difficulties influence their use of reading strategies. Thematic analysis of the responses revealed three main challenges: (1) limited commitment to engaging with digital features, (2) insufficient literacy skills, and (3) inadequate strategic approaches. The most frequently reported challenges, as described directly by the students, are outlined below.

> *"Reading online isn't comfortable for me. Looking at the screen for too long hurts my eyes and makes it hard to focus." (P3)*

> *"Sometimes when I'm reading, my battery runs low and I have to look for a charger. It breaks my concentration." (P8)*

"It's hard to find important info in online texts because I have to keep scrolling up and down. It's confusing when I can't see everything at once." (P15)

"I'm not really into reading, especially when it's in English. My vocabulary isn't strong enough to read quickly and understand well." (P20)

"I miss being able to highlight or write notes like I do with printed books. That helps me remember things better." (P21)

"I don't really know what strategies to use when reading online to help me understand the text." (P27)

The responses from the open-ended questionnaire reveal several key challenges students face when engaging with online reading. The first issue center on students' low motivation to read on digital screens, largely due to the discomfort and strain caused by prolonged screen exposure. Many students noted that screen overuse negatively affected their visual health, leading to a decline in motivation and minimal exploration of web content. In addition, technical distractions, such as pop-up notifications, were frequently cited as disruptive, causing students to lose focus and reducing both their reading comprehension and task completion. Another related concern was the limited screen size of digital devices, which only displayed small portions of text at a time. This forced students to repeatedly scroll, making it harder to locate or synthesize information across sections of the text. In contexts where mobile devices are the primary access point to digital learning, this challenge is even more pronounced, especially among students with limited digital literacy. The second challenge involved limited literacy skills. Some students reported difficulty in identifying important information and constructing meaning from the text, particularly due to low vocabulary mastery, which hindered both reading speed and comprehension. This also contributed to reduced interest and engagement with the material. The third challenge was the lack of effective reading strategies. Few students employed helpful approaches such as note-taking, highlighting, or bookmarking while reading online. Despite the known benefits of support strategies in aiding comprehension, many students did not organize or record key ideas, making it harder to process and retain information. This lack of strategy use may reflect insufficient instruction on how to transfer traditional reading strategies into digital contexts, suggesting a pedagogical gap that needs to be addressed. In summary, the challenges students faced with online reading stemmed from three major factors: discomfort with digital features, insufficient literacy skills, and a lack of metacognitive reading strategies to support deeper understanding.

The discussion primarily focused on two research questions: gender disparities in the utilization of metacognitive reading strategies during online reading and students' perspectives on the challenges of online reading. In relation to the first question, the findings revealed that both male and female students applied metacognitive strategies at a moderate level, with both groups frequently engaging in these strategies. This outcome aligns with previous research by

Khreisat, (2022), Rianto, (2021), and Wallace et al., (2021), which also reported no significant gender differences in metacognitive strategy use in online contexts. Similar conclusions were drawn by Deliany and Cahyono (2020), reinforcing the idea that gender does not strongly influence strategy application in digital reading environments. However, this finding stands in contrast to earlier studies such as Acar-Erdol and Akin-Arikan (2022), Pradita (2020), and Rianto (2021), which reported more pronounced gender-based differences. Although the statistical analysis in the current study did not reveal a significant gap, a closer look at the data showed that female students exhibited a greater tendency for employing metacognitive strategies more frequently across all three categories: global strategies, problem-solving strategies, and support strategies. This suggests that while performance may be similar overall, female learners demonstrate a broader and more consistent application of metacognitive approaches. This observation aligns with Sheorey and Mokhtari (2001) argument that skilled readers tend to employ a greater range of metacognitive strategies compared to their less skilled counterparts.

This study also revealed that problem-solving strategies were the most commonly utilized by both male and female students in online reading, followed by global strategies and then support strategies. These findings are consistent with Wallace et al. (2021), who observed a similar pattern among Chinese EFL undergraduates in Macau, highlighting that student often adopt problem-solving approaches when encountering reading difficulties. In the current study, such strategies included adjusting reading speed, reading carefully, and inferring the meanings of unfamiliar words—all essential for effective comprehension. Many students appeared to slow down during challenging sections and focus on detailed information, suggesting that vocabulary knowledge played a significant role in their ability to understand the texts. Although no significant gender differences were found overall, female students showed a greater tendency to attend to textual details, while male students seemed to rely more on visual elements to aid comprehension. A Malaysian study (Abdullah & Ismail, 2025) also found that problem-solving strategies were most frequent among secondary ESL learners, while support strategies were underused. In terms of global reading strategies, students used these to set reading goals, activate prior knowledge, and apply contextual and textual cues to guide their understanding. This approach aligns with Kintsch (1988) and Amadieu et al. (2010) research, which emphasized the value of previous knowledge in facilitating students' understanding toward reading and maintaining coherence in reading sequences. Notably, female students outperformed males in several global strategy items, suggesting a higher level of academic reading skills in this area. Support strategies, including note-taking, using reference tools, and mind mapping, were the least frequently used. Nonetheless, students acknowledged the value of these strategies in organizing and retaining information. As Jain (2015) points out, mind mapping helps summarize key concepts and establish connections among ideas. A clear gender gap emerged in this category, with female students demonstrating stronger self-regulation, including behaviors like highlighting, printing, reading aloud, and using visual aids. Male students, in contrast, reported less engagement with

support strategies, suggesting a weaker interaction with the structural tools that facilitate deeper comprehension in online reading.

Although students generally expressed a positive attitude toward online reading, the qualitative findings revealed that implementing reading through online platforms still posed notable challenges. While many students acknowledged the benefits of online reading, not all found the experience favorable. Three primary challenges emerged: limited engagement with digital features, low literacy skills, and a lack of metacognitive reading strategies. Technical difficulties were among the most commonly cited obstacles during online reading activities. According to Chou (2016), such challenges often become more apparent once the initial novelty of online reading fades. Over time, however, students' discomfort may diminish as they become more familiar with digital platforms and begin developing consistent online reading habits. The second major challenge related to insufficient literacy skills, particularly vocabulary knowledge, which plays a crucial role in reading comprehension. Students tended to approach online texts in a similar way to printed materials, but those with limited vocabularies struggled to fully grasp the meaning of texts. This finding is aligned with the problem-solving dimension of metacognitive strategies, which emphasizes the ability to infer meanings of unfamiliar words as a critical skill for understanding. Lastly, the lack of metacognitive reading strategies was another barrier in online reading. Not all students were aware of how strategic reading could support their comprehension. The application of metacognitive strategies is essential in managing digital distractions and enhancing overall reading effectiveness. Developing such awareness could help students better regulate their reading process, especially in the complex and often distracting environment of online texts. These insights highlight the importance of integrating explicit metacognitive strategy training into EFL curricula to help students overcome both linguistic and technological challenges.

Based on the findings of this study, a gender disparity in the use of metacognitive online reading strategies was observed, particularly within the support strategy category. The results indicate that female students consistently employed a greater range of strategies including problem-solving, global, and support strategies compared to their male counterparts. The frequent use of problem-solving and global strategies across both genders suggests that students were engaging in higher-order cognitive processes to extract meaning from online texts. Reading in a digital environment adds another layer of complexity, as students must navigate not only the content but also the technological features embedded in the platform (Zaki et al., 2009). This dual focus can heighten the cognitive demands of the reading process. For undergraduate students who may be considered novice readers with limited strategic awareness and linguistic proficiency, these challenges can hinder successful comprehension. To address this, raising students' awareness of diverse metacognitive strategies is essential. Equipping learners with these tools can significantly enhance their ability to comprehend and manage online reading tasks more effectively.

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CONCLUSION AND SUGGESTION

In relation to the findings of this study, it was confirmed that both male and female students demonstrated a moderate level of metacognitive strategy use in online reading. While gender did not have a statistically significant impact on the overall selection of metacognitive strategies, minor differences were still observed, with female students consistently using these strategies more frequently than their male peers. Notably, gender differences were found across all three categories of metacognitive strategies: global, problem-solving, and support strategies, with higher mean scores for female students, suggesting that they possessed stronger skills in managing online reading tasks. This trend may be attributed to female students' greater self-regulation and motivation in language-related activities, as reported in previous research. From a pedagogical perspective, these findings underscore the need for educators to foster greater awareness and use of metacognitive strategies in online reading contexts for both genders. Teachers are crucial in supporting students' development of language and literacy, especially by addressing the specific challenges students encounter in digital reading environments. Providing structured exposure to online reading materials and familiarizing students with online text features can help learners build effective strategies for navigating online content. Furthermore, students should be encouraged to explore and apply appropriate techniques to overcome difficulties in online reading. Despite the meaningful findings, limitations of this study include its reliance on self-reported data, which may not fully capture the actual use of metacognitive strategies in practice and the sample size was relatively small, which may limit the generalizability of the results. Future research is recommended to examine the actual implementation of reading strategies among EFL learners in digital contexts and employ larger samples to extend the findings.

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Appendix

Questionnaire of Gender Gap in Metacognitive Reading Strategy

Directions: Please answer this questionnaire by selecting one of the four options for each item according to your personal situation and condition (1 = Never, 2 = Rarely, 3 = Often, 4 = Always).

1. I read online texts with a specific purpose or goal in mind.
2. I evaluate if the online text is appropriate or relevant for my needs.
3. I review the structure and length of the online text before reading.
4. I use the internet to find information that supports my academic work.
5. I use visual text features such as bold print, italics, headings, colors, and fonts to identify key points.
6. I analyze and assess the content of the text thoroughly.
7. I make sure that I comprehend the new information presented in the text..
8. I draw on my existing knowledge to aid in understanding the online material.
9. I review the overall structure of the online text before beginning to read.
10. I read carefully and at a slow pace to better grasp the content.
11. I make an effort to refocus when I lose concentration while reading online.
12. I adjust how fast I read depending on the nature of the online material.
13. I am able to identify which parts of the text are important and which can be skipped.
14. I slow down and pay extra attention when the content is hard to understand.
15. I pause to reflect on what I've already read to ensure understanding.
16. I attempt to visualize any information from online text.
17. I move through the online text to revisit and connect information.
18. I print out the online material to allow space for note-taking..
19. I take notes while reading online to support my understanding of the text.
20. I utilize reference tools such as online dictionaries to interpret unfamiliar words.
21. I rely on visuals like images, mind maps, or charts to better grasp the content.
22. I occasionally rephrase the sentence
23. I read the online text out loud when I find it hard to comprehend.