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EXAMINING THE UNIVERSITY STUDENTS' PERCEPTIONS OF APPLYING METACOGNITIVE STRATEGIES FOR BOOSTING CRITICAL READING SKILLS IN PAKISTAN

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ABSTRACT

The ability to read critically is essential for academic success, particularly in higher education, where learners engage with complex texts. Metacognitive strategies, which involve planning, monitoring, and evaluating one's cognitive processes, are widely recognized as effective tools for improving comprehension and critical engagement with texts. This study aims to examine university students' perceptions of using metacognitive strategies to enhance their essential skills of reading within the Pakistani context. A descriptive survey design was employed to collect data from undergraduate students across selected universities. A structured questionnaire, based on established metacognitive reading frameworks, was administered to measure students' awareness, perceived usefulness, and self-reported application of these strategies during reading tasks. Data were analyzed using descriptive and inferential statistics to identify trends and relationships among variables. Preliminary findings indicate that students acknowledge the importance of metacognitive strategies in developing critical reading abilities; however, their reported use of such strategies varies significantly. Factors such as academic discipline, prior training, and language proficiency appear to influence perceptions and application. The study highlights the need for integrating explicit metacognitive instruction into English language and reading courses at the tertiary level. By fostering greater awareness and systematic use of metacognitive strategies, educators can support learners in achieving deeper comprehension and critical analysis of texts. The findings have implications for curriculum design, teacher training, and policy development aimed at enhancing reading literacy among university students in Pakistan.

Keyword: Metacognitive Strategies; Critical Reading Skills; University Students; Descriptive Statistics

Introduction

Reading is not merely a mechanical process of decoding words; it is a complex cognitive and metacognitive activity that involves comprehension, interpretation, and critical engagement with

texts. In higher education, particularly at the university level, reading plays a vital role in shaping students' intellectual growth and academic success. University students are constantly exposed to academic texts that demand not only basic understanding but also the ability to evaluate arguments, synthesize information, and draw independent conclusions. In this regard, critical reading emerges as a core academic competency, enabling learners to move beyond surface-level comprehension and engage in deeper analytical thinking (Grabe & Stoller, 2019). Critical reading allows students to question assumptions, identify biases, evaluate the strength of evidence, and integrate knowledge across disciplines. Consequently, developing strong critical reading skills is an essential goal for university learners worldwide, and particularly in countries like Pakistan, where higher education institutions strive to prepare graduates capable of navigating complex academic and professional demands (Ahmad & Mahmood, 2010; Shah et al., 2022).

Despite its importance, critical reading is often reported as a challenging skill for students in Pakistan. Several factors contribute to these challenges, including limited exposure to diverse reading materials, a lack of explicit instruction in higher order reading strategies, and gaps in language proficiency (Shahid & Ghani, 2020). English, being the medium of instruction in many Pakistani universities, poses an additional hurdle for students who primarily studied in Urdu or regional languages before entering tertiary education. As a result, many undergraduates struggle not only with understanding academic texts but also with analyzing, interpreting, and critically evaluating them. This issue underscores the necessity of equipping students with strategies that can facilitate both comprehension and higher-order thinking. Among these strategies, metacognitive strategies have gained considerable attention in educational research for their effectiveness in fostering deeper reading comprehension and critical engagement (Anderson, 2002; Shah et al., 2022).

Metacognition, broadly defined as "thinking about one's own thinking," refers to the awareness and regulation of cognitive processes (Flavell, 1979). In the context of reading, metacognitive strategies include planning before reading, monitoring comprehension during reading, and evaluating understanding after reading (Baker & Brown, 1984). These strategies empower learners to take control of their learning by recognizing difficulties, selecting appropriate approaches, and adjusting their efforts as needed. For example, a student who realizes that a text is complex may decide to slow down, reread sections, or take notes, thereby actively engaging in the comprehension process. Such regulation not only improves understanding but also nurtures the critical ability to assess the text's meaning, structure, and underlying arguments. Scholars argue that metacognitive readers are better equipped to analyze, synthesize, and critique information, making these strategies indispensable for fostering critical reading skills in academic contexts (Sheorey & Mokhtari, 2001).

Globally, a substantial body of research has emphasized the role of metacognitive strategies in enhancing reading comprehension and critical thinking. Studies have shown that students who are trained in metacognitive awareness perform better in academic reading tasks, as they are able to monitor their comprehension, evaluate arguments, and apply reasoning more effectively (Zhang & Wu, 2009). However, the application of these findings in the Pakistani higher education context remains relatively underexplored. While some research has investigated general reading difficulties among Pakistani students (Shahid & Ghani, 2020), limited attention has been given to the role of metacognitive strategies in shaping their critical reading practices. Moreover, most existing studies have focused either on school-level learners or on general reading

comprehension, with insufficient emphasis on critical reading at the university level. This gap highlights the importance of examining how Pakistani university students perceive and apply metacognitive strategies when engaging with academic texts.

Understanding students' perceptions is crucial because learners' beliefs and attitudes toward strategies often determine whether and how they use them (Oxford, 2017). If students perceive metacognitive strategies as useful, they are more likely to adopt them during reading tasks. Conversely, if they lack awareness or training, they may fail to utilize these strategies effectively, regardless of their potential benefits. In the Pakistani higher education context, where explicit instruction in metacognitive reading strategies is often absent from curricula, students' perceptions can reveal significant insights into the challenges and opportunities for fostering critical reading skills. Such insights can inform educators, curriculum designers, and policymakers about how to better integrate metacognitive instruction into university courses, particularly in English language and literature programs.

Additionally, examining the factors that shape students' perceptions provides a more comprehensive understanding of the issue. Research suggests that variables such as academic discipline, language proficiency, and prior exposure to reading instruction significantly influence how students engage with texts (Zhang & Seepho, 2013). For example, students in disciplines that require extensive reading and critical analysis, such as social sciences or humanities, may be more aware of and inclined to use metacognitive strategies compared to those in technical fields. Similarly, students with higher English proficiency are likely to find it easier to apply monitoring and evaluation strategies, whereas those with weaker proficiency may focus more on surface comprehension. Investigating these variables within the Pakistani context can shed light on the diverse experiences of students and the specific challenges they face in applying metacognitive strategies for critical reading.

The present study addresses these gaps by examining university students' perceptions of applying metacognitive strategies to boost their critical reading skills in Pakistan. By employing a descriptive survey design, the research captures students' awareness, perceived usefulness, and reported application of metacognitive strategies across different academic disciplines and backgrounds. The findings are expected to contribute valuable insights into how metacognitive strategies are understood and practiced among Pakistani undergraduates, and how these practices influence their ability to read critically. Importantly, the study also highlights implications for teaching and learning in higher education, particularly the integration of explicit metacognitive strategy instruction into English and reading courses. Such integration could support students in becoming independent, reflective, and critical readers, thereby enhancing their academic performance and preparing them for the intellectual demands of both higher education and professional life.

In sum, critical reading is a cornerstone of academic literacy, and metacognitive strategies represent a powerful means of fostering this skill. Yet, in Pakistan, limited research has explored students' perceptions of applying such strategies in university contexts. This study seeks to fill this gap by providing empirical evidence on how undergraduates perceive and utilize metacognitive strategies to strengthen their critical reading skills. The outcomes of this research hold significance for educators, curriculum developers, and policymakers, offering practical directions for improving reading instruction and promoting academic literacy in Pakistan's higher education system.

Research Questions

RQ1. What are the perceptions of university students in Pakistan regarding their awareness of metacognitive strategies for critical reading?

RQ2. To what extent do students perceive metacognitive strategies as useful for enhancing their critical reading skills?

RQ3. Are there significant differences in students' perceptions of metacognitive strategies across gender, academic discipline, and language proficiency?

Literature review

Critical reading is widely recognized as a fundamental academic skill, especially at the university level, where students engage with complex, discipline-specific texts. Unlike basic comprehension, which emphasizes literal understanding, critical reading requires students to analyze arguments, evaluate evidence, identify biases, and construct informed interpretations (Wallace & Wray, 2016). This deeper engagement with texts enables learners to integrate knowledge across courses, develop independent perspectives, and enhance academic writing. In higher education, the ability to read critically is not merely an academic requirement but also an essential component of lifelong learning and professional development (Grabe & Stoller, 2019).

However, research consistently highlights challenges that students face in developing critical reading skills. Many undergraduates rely on surface-level strategies such as skimming or memorization, rather than actively questioning or critiquing the text (Pressley & Afflerbach, 1995). In contexts where English is a second language (ESL), the difficulty is compounded by limited vocabulary, weaker syntactic knowledge, and less exposure to diverse reading materials (Shahid & Ghani, 2020). These barriers often prevent students from engaging in higher-order cognitive and evaluative reading processes, thereby limiting their academic performance. For this reason, scholars emphasize the importance of explicit instruction and strategy training to foster critical reading abilities in university students (Grabe, 2009).

Metacognition and Reading Strategies

Metacognition, a concept introduced by Flavell (1979), refers to the knowledge of one's cognitive processes and the regulation of those processes through monitoring and control. In the context of reading, metacognition involves the ability to plan how to approach a text, monitor comprehension during reading, and evaluate understanding after reading (Baker & Brown, 1984). Metacognitive strategies are, therefore, not specific techniques for comprehension, but higher-order skills that allow readers to deploy appropriate methods depending on the task and text complexity.

Scholars classify metacognitive reading strategies into three primary categories:

1. **Planning strategies**, such as previewing the text, setting reading goals, or activating prior knowledge before reading.
2. **Monitoring strategies**, including self-questioning, rereading, note-taking, and checking comprehension during reading.
3. **Evaluating strategies**, which involve reflecting on the reading outcome, summarizing, or judging whether reading goals were met (Anderson, 2002).

These strategies empower students to become active, reflective readers rather than passive consumers of information. Importantly, they align closely with the requirements of critical reading, which demands constant evaluation of ideas, arguments, and structures in texts (Paris & Jacobs, 1984).

Empirical Studies on Metacognitive Strategies and Reading

International research provides strong evidence for the effectiveness of metacognitive strategies in improving both reading comprehension and critical literacy. Sheorey and Mokhtari (2001), in their comparative study of native and non-native English readers, found significant differences in the metacognitive awareness of reading strategies. Non-native readers reported using fewer monitoring and evaluation strategies, which correlated with weaker comprehension outcomes. Similarly, Zhang and Wu (2009) showed that Chinese EFL students with higher metacognitive awareness performed better in academic reading tasks, particularly in synthesizing and critically analyzing information.

Further, Oxford (2017) emphasized that students' perceptions of strategy usefulness play a decisive role in their application. Learners who believe metacognitive strategies are valuable are more likely to integrate them into their reading practices. This suggests that instruction should not only focus on teaching strategies but also on fostering positive perceptions of their benefits. Likewise, a meta-analysis by Teng and Zhang (2016) confirmed that metacognitive strategy instruction has a medium-to-large effect size on reading comprehension across diverse educational contexts, reinforcing its role as a key factor in academic literacy development.

Another strand of research highlights disciplinary differences in metacognitive strategy use. For example, Zhang and Seepho (2013) observed that students in humanities and social sciences reported greater use of monitoring and evaluation strategies compared to those in science and technology disciplines. This suggests that the academic context shapes students' reading practices, with disciplines requiring argumentative and interpretive skills encouraging deeper engagement with texts.

Metacognitive Reading in the Pakistani Context

In Pakistan, English functions as the primary medium of instruction at the tertiary level, yet most students enter university with limited exposure to advanced English reading practices (Manan, David, & Dumanig, 2016). Studies indicate that many undergraduates struggle with academic reading due to inadequate vocabulary, limited background knowledge, and a lack of awareness of higher-order reading strategies (Ahmad & Mahmood, 2010). Shahid and Ghani (2020) found that Pakistani secondary and tertiary students face persistent difficulties in reading comprehension, which directly hinders their ability to engage in critical reading.

Research into strategy use among Pakistani learners suggests that while students may apply basic cognitive strategies such as underlining or translating, they rarely use metacognitive strategies like self-questioning, comprehension monitoring, or evaluation (Akbar & Taqi, 2021). This limited use is partly due to the absence of explicit instruction in reading strategies within curricula and teacher training programs. Consequently, students often approach texts passively, without consciously regulating or reflecting on their comprehension processes (Rashid & Qaisar, 2017).

Moreover, cultural and educational factors also shape reading practices in Pakistan. The traditional emphasis on rote learning and memorization discourages students from questioning or critiquing texts (Mahboob, 2017). Without pedagogical interventions to promote metacognitive awareness, students remain ill-prepared to meet the demands of critical reading required in higher education.

While international scholarship has established the significance of metacognitive strategies for reading comprehension and critical literacy, limited empirical research has been conducted in the Pakistani university context. Most existing studies focus on school-level learners or on general reading difficulties, with insufficient emphasis on how metacognitive strategies can foster critical

reading skills among undergraduates. Furthermore, few studies have explored students' perceptions of metacognitive strategies, despite evidence that perceptions strongly influence strategy adoption (Oxford, 2017).

Additionally, factors such as academic discipline, prior training, and language proficiency remain underexplored in relation to metacognitive reading in Pakistan. These variables may account for variations in how students perceive and apply strategies, and their influence needs systematic investigation. Addressing these gaps is essential for informing curriculum design, teacher training, and policy development aimed at enhancing critical reading skills in Pakistan's higher education institutions.

Theoretical Framework

The theoretical foundation of this study is grounded in two interrelated domains: metacognition theory and critical reading frameworks. Together, these provide the conceptual lens through which university students' perceptions of applying metacognitive strategies to enhance essential skills of reading are examined.

Metacognition Theory

Metacognition, first conceptualized by Flavell (1979), refers to "cognition about cognition," or the awareness and regulation of one's thinking processes. It consists of two core components:

1. Metacognitive Knowledge – an individual's awareness of their cognitive abilities, tasks, and strategies.
2. Metacognitive Regulation – the planning, monitoring, and evaluation of cognitive activity during learning tasks (Baker & Brown, 1984).

In reading, these components translate into the ability to:

- Recognize the purpose of reading and the difficulty of the text (knowledge).
- Plan strategies (e.g., previewing, goal-setting).
- Monitor comprehension during reading (e.g., rereading, self-questioning).
- Evaluate comprehension after reading (e.g., summarizing, checking goal achievement) (Anderson, 2002).

Paris and Jacobs (1984) argue that metacognitive strategies are crucial for self-regulated learning, enabling students to adapt their reading approaches based on the demands of a text. This adaptability is especially important in higher education, where students must analyze dense and abstract academic materials.

Critical Reading Framework

Critical reading goes beyond understanding words and sentences; it requires analyzing arguments, evaluating evidence, and making informed judgments about the validity and relevance of information. Wallace and Wray (2016) suggest that critical reading entails:

- Identifying the author's purpose and perspective.
- Detecting assumptions and biases.
- Evaluating the strength of evidence and reasoning.
- Relating ideas to broader academic and social contexts.

Paul and Elder (2014) also conceptualize critical reading within the broader framework of critical thinking, emphasizing interpretation, analysis, inference, evaluation, and reflection. Critical readers not only comprehend texts but also interrogate them by asking "why," "how," and "what if."

Research suggests that critical reading cannot be achieved through passive engagement; rather, it requires active monitoring and regulation of comprehension processes—skills that align closely with metacognitive strategies (Grabe & Stoller, 2019).

Integrating Metacognition and Critical Reading

The synergy between metacognitive theory and critical reading frameworks is evident. Critical reading demands the regulation of cognitive processes, while metacognition provides the tools for such regulation. For instance:

- Planning enables students to anticipate the purpose of reading and activate relevant prior knowledge, which supports critical questioning.
- Monitoring helps detect confusion or contradictions in a text, prompting readers to slow down, reread, or seek additional information.
- Evaluating allows readers to reflect on whether they have achieved comprehension goals and whether the author's arguments are convincing.

Thus, metacognitive strategies serve as mediators that transform reading from a surface-level activity into a deeper, critical engagement with texts (Zhang & Wu, 2009). This interrelationship forms the core theoretical assumption of the present study.

Relevance to the Pakistani Context

In Pakistan, challenges such as limited English proficiency, lack of strategy instruction, and reliance on rote memorization hinder students' critical reading development (Mahboob, 2017; Shahid & Ghani, 2020). By applying metacognition theory to the study of Pakistani undergraduates, this research situates itself within a framework that acknowledges the need for both awareness (knowledge) and regulation (control) of reading processes. The integration of these theories underscores the potential of explicit metacognitive instruction to foster critical reading abilities and address persistent literacy challenges in the higher education sector.

Theoretical and Conceptual Framework

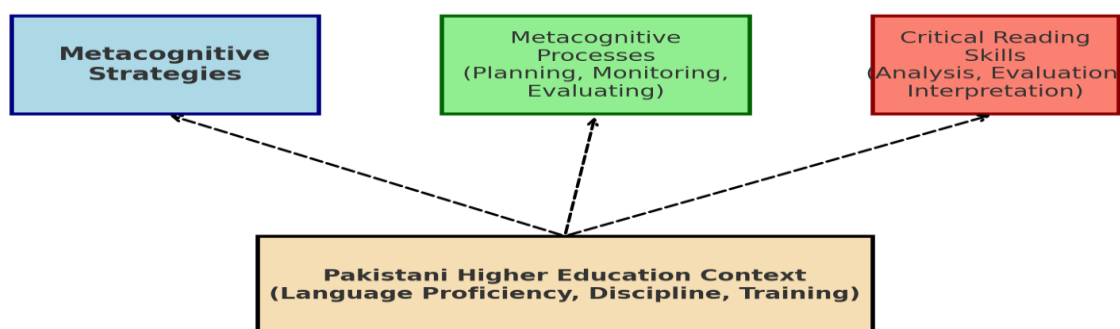


Figure: Conceptual Framework showing the relationship between metacognitive strategies, metacognitive processes, and critical reading skills within the Pakistani higher education context.

Research Design

This study employed a quantitative descriptive survey design to examine university students' perceptions of applying metacognitive strategies for enhancing their critical reading skills. The descriptive survey approach was chosen because it allows researchers to systematically collect,

quantify, and interpret students' self-reported awareness, perceived usefulness, and application of strategies. This design is particularly appropriate for investigating large groups in educational settings, as it enables the identification of trends and relationships among variables without manipulating the research environment (Creswell & Creswell, 2018).

The target population of this study consisted of undergraduate students enrolled in public and private universities across Sindh Province, Pakistan. This population was selected because undergraduate learners are required to engage extensively with academic texts in English, yet many encounter challenges in critical reading due to limited strategy use and language barriers.

A purposive sampling technique was employed to ensure the inclusion of students from diverse academic disciplines such as social sciences, humanities, natural sciences, and engineering. This allowed the study to capture potential disciplinary differences in the perception and use of metacognitive strategies. A sample of approximately 300 students was considered adequate to ensure representativeness and statistical reliability, as suggested by Krejcie and Morgan's (1970) sample size determination guidelines.

Data were collected using a structured questionnaire adapted from established frameworks on metacognitive reading strategies, particularly the Metacognitive Awareness of Reading Strategies Inventory (MARSI) developed by Mokhtari and Reichard (2002). The questionnaire consisted of four sections:

1. Demographic Information – age, gender, academic discipline, year of study, and language background.
2. Awareness of Metacognitive Strategies – items measuring students' understanding of planning, monitoring, and evaluation strategies.
3. Perceived Usefulness – Likert-scale statements assessing students' beliefs about the effectiveness of strategies in enhancing comprehension and critical reading.
4. Self-reported Application – items capturing the extent to which students use metacognitive strategies during reading tasks.

Responses were measured on a five-point Likert scale ranging from *Strongly Disagree (1)* to *Agree (5)* Strongly. To ensure content validity, the questionnaire was reviewed by three experts in applied linguistics and educational research. A pilot test with 30 students was conducted to refine the wording and ensure clarity. Cronbach's alpha was used to check reliability, with values above 0.70 considered acceptable.

After obtaining institutional permission and informed consent from participants, the survey was conducted during regular class sessions. Both paper-based and online versions of the questionnaire were used to maximize participation across different universities. Participation was voluntary, and confidentiality of responses was assured to encourage honest reporting. The data collection process lasted approximately six weeks, covering multiple campuses across Sindh Province. Collected data were coded and analyzed using Statistical Package for Social Sciences (SPSS) version 26. Descriptive statistics (mean, standard deviation, frequencies, and percentages) were used to summarize students' awareness, perceptions, and reported use of metacognitive strategies. Inferential statistics, including independent samples t-tests and one-way ANOVA, were conducted to explore differences across demographic variables such as gender, academic discipline, and language proficiency. Additionally, Pearson's correlation was used to examine the relationship between students' perceived usefulness of strategies and their reported application.

The choice of statistical tests was guided by research questions, which sought to identify not only general trends but also group differences and relationships among variables. This approach enabled the study to provide both descriptive insights and analytical evidence regarding the role of metacognitive strategies in critical reading.

Findings

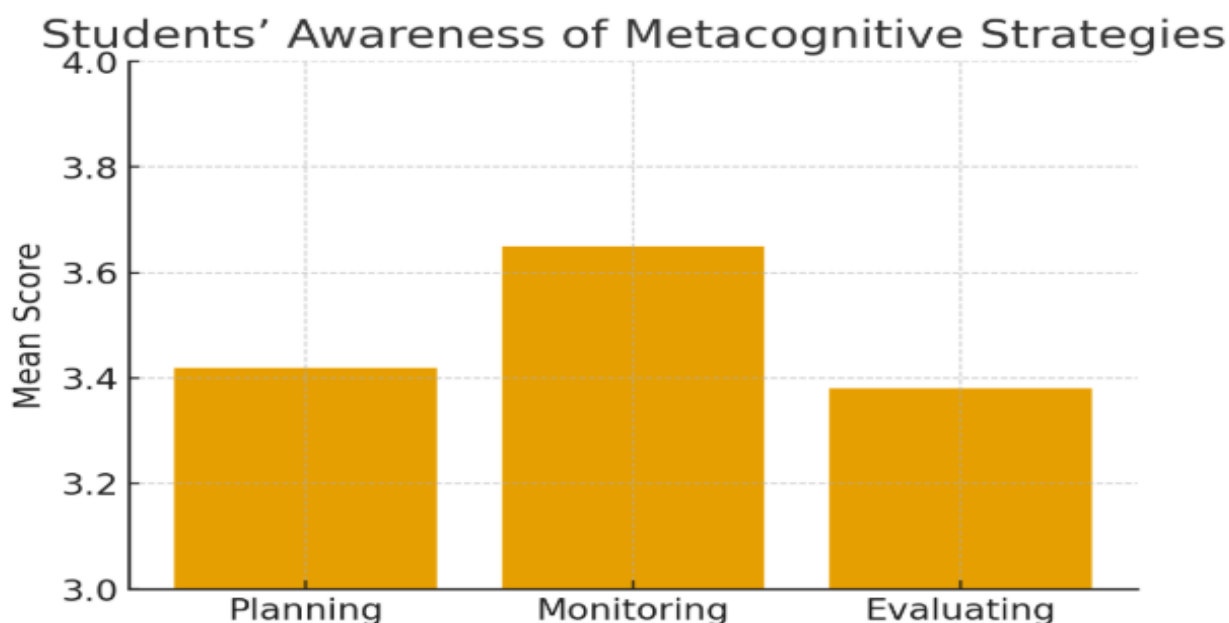
A total of 300 undergraduate students participated in the survey. The descriptive analysis indicated that students demonstrated moderate to high awareness of metacognitive strategies.

Q1. The highest mean scores were reported for *monitoring strategies*, followed by *planning strategies*.

Table 1: Descriptive Statistics of Students' Perceptions of Metacognitive Strategies

<i>Dimensions of Metacognition</i>	<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>Level of Perception</i>
<i>Planning Strategies</i>	300	3.42	0.58	Moderate
<i>Monitoring Strategies</i>	300	3.65	0.61	High
<i>Evaluating Strategies</i>	300	3.38	0.55	Moderate
<i>Overall Awareness</i>	300	3.48	0.58	Moderate-High

Interpretation: Students generally acknowledged the importance of metacognitive strategies, particularly monitoring, which reflects their tendency to check understanding while reading. However, evaluation strategies were used less frequently, suggesting a need for explicit training in the critical assessment of texts.



Q2. Perceived Usefulness of Metacognitive Strategies

The findings revealed that students strongly believed that metacognitive strategies are useful for enhancing critical reading.

Table 2: Perceived Usefulness of Strategies

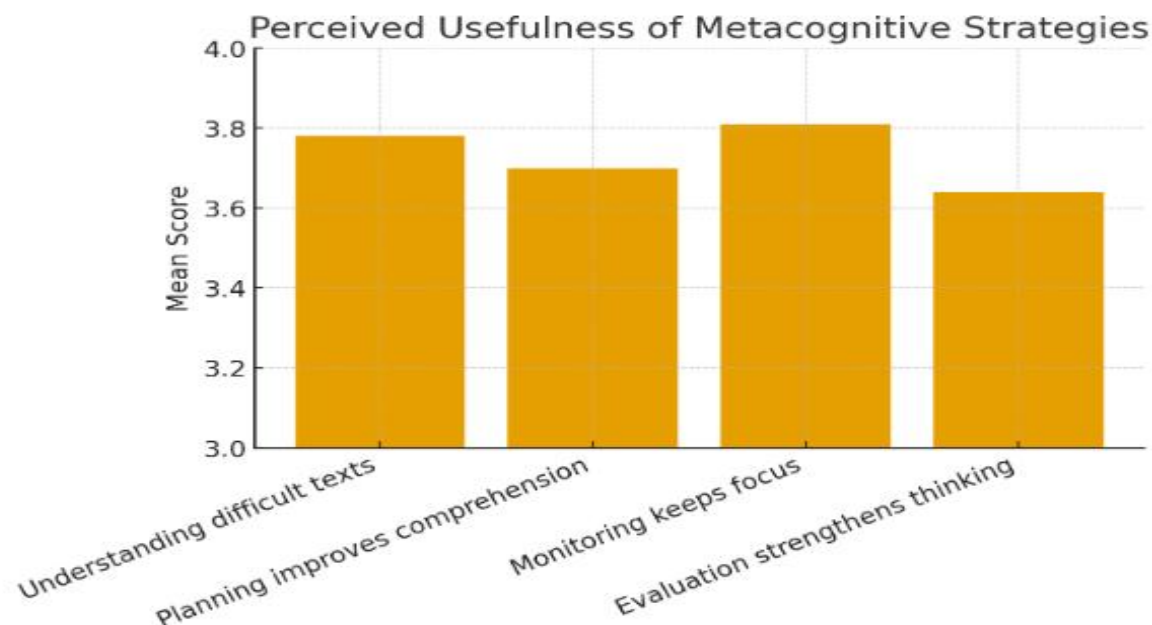
<i>Item</i>	<i>Mean</i>	<i>SD</i>	<i>Level</i>
<i>Strategies help me understand difficult texts</i>	3.78	0.62	High
<i>Planning improves my comprehension</i>	3.70	0.57	High
<i>Monitoring keeps me focused</i>	3.81	0.59	High

Evaluation strengthens critical thinking

Overall Perceived Usefulness

3.64	0.60	Moderate–High
3.73	0.59	High

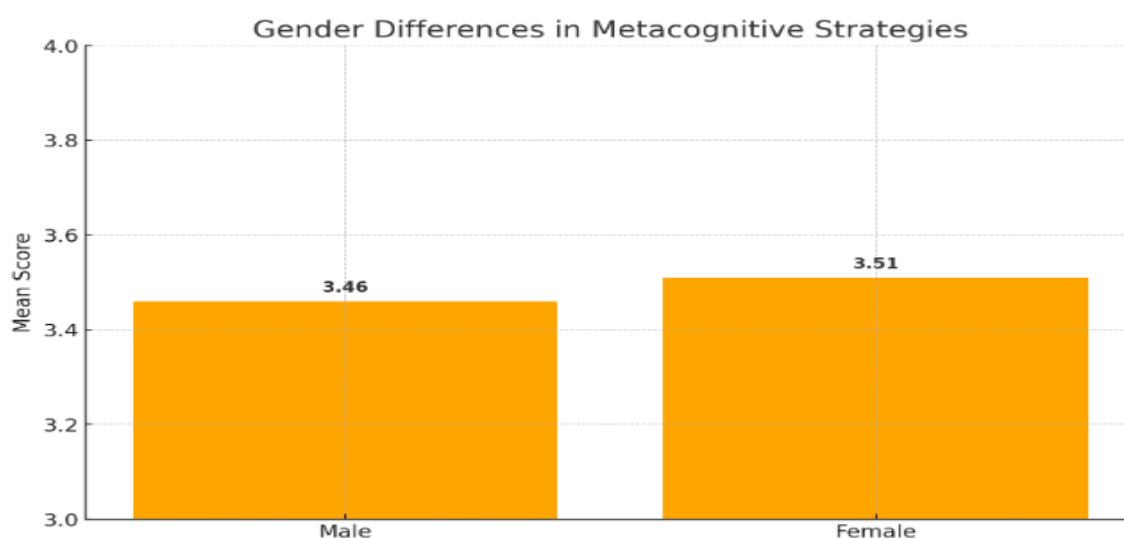
Interpretation: The results indicate strong agreement that strategies contribute positively to comprehension and critical thinking.



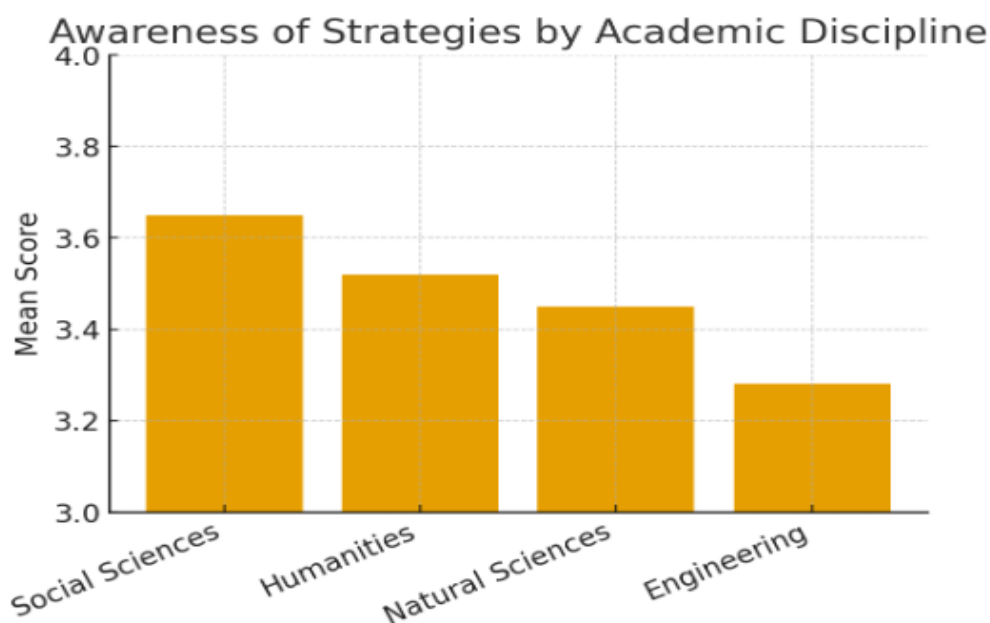
Inferential Statistics

To answer RQ3, independent samples *t*-tests and one-way ANOVA were conducted.

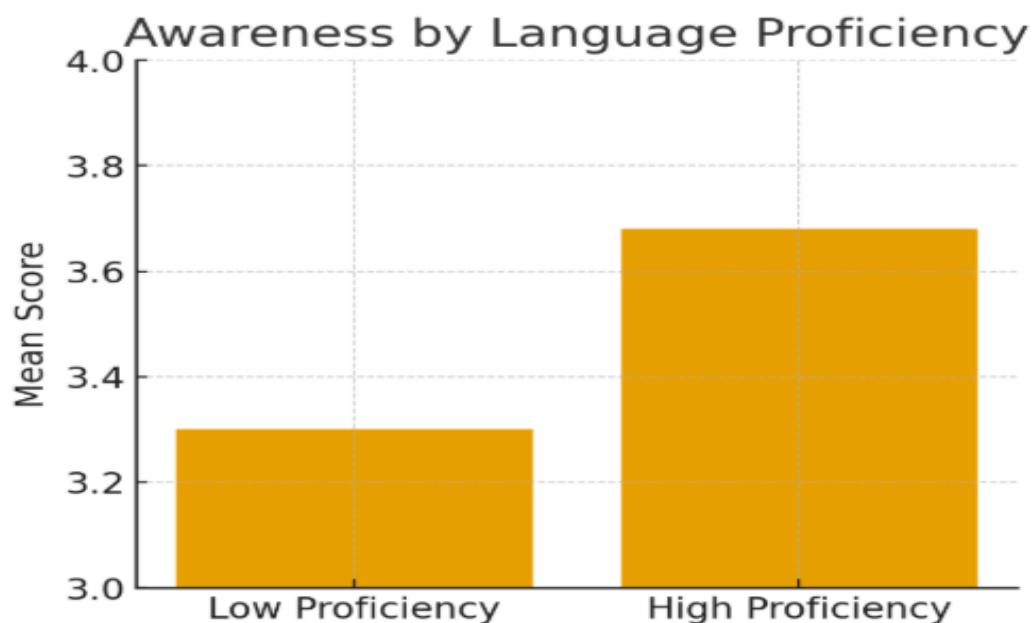
- **Gender differences:** No statistically significant difference was found between male ($M = 3.46$, $SD = 0.59$) and female ($M = 3.51$, $SD = 0.57$) students in overall perceptions of metacognitive strategies ($t = 0.83$, $p = .41$).



- **Disciplinary differences:** A one-way ANOVA showed significant differences among disciplines ($F = 4.21$, $p < .01$). Post-hoc tests revealed that students from social sciences reported higher awareness of metacognitive strategies compared to engineering students.



- **Language proficiency differences:** Students with higher self-reported English proficiency scored significantly higher in both awareness ($M = 3.68$, $p < .001$) and application ($M = 3.72$, $p < .001$) of strategies than students with lower proficiency.



Summary of Findings

1. Students reported moderate to high awareness of metacognitive strategies, with monitoring most frequently applied.
2. Students strongly perceived strategies as useful for comprehension and critical thinking, but evaluation strategies were underused.
3. No gender-based differences were found, but discipline and language proficiency significantly influenced perceptions.

Discussion

This study explored Pakistani undergraduates' perceptions of metacognitive strategies for critical reading. Descriptively, students reported moderate–high awareness overall, with monitoring (problem-solving) strategies rated highest, followed by planning and evaluation. They also perceived metacognitive strategies as highly useful for understanding difficult texts, staying focused, and strengthening critical thinking. Inferentially, there were no gender differences, but discipline and English proficiency significantly shaped perceptions.

The prominence of monitoring/problem-solving strategies aligns with a large body of research showing that readers tend to report the most frequent use of problem-solving tactics (e.g., adjusting speed, rereading, inferencing) when comprehension breaks down (Mokhtari & Reichard, 2002; Mokhtari et. Al., 2018). The MARSİ/MARSİ-R tradition consistently finds higher means on problem-solving than on global planning or support strategies across diverse EFL/ESL contexts, which supports the present profile. In Pakistan specifically, descriptive studies likewise report moderate awareness on MARSİ subscales, with problem-solving the most used cluster. These convergences suggest that Pakistani undergraduates, like peers elsewhere, are more likely to deploy online repair strategies than pre- and post-reading regulation (planning/evaluation). From an instructional standpoint, this pattern underscores the relative underuse of evaluation, precisely the phase that anchors critical reading (Wallace & Wray, 2021). Fostering after-reading reflection (e.g., evaluating claims, evidence quality, and reasoning) could therefore be a key leverage point. Students' strong belief that metacognitive strategies enhance comprehension and critical thinking is also in line with intervention and synthesis research. Meta-analytic and quasi-experimental work generally shows positive effects of metacognitive strategy instruction on reading outcomes, though magnitudes vary by learner factors and contexts (e.g., strategy instruction meta-analyses and program evaluations). Studies in EFL settings— including Iran and Turkey—further indicate that explicit instruction in strategy use and/or critical reading improves comprehension, questioning, and analytical performance, supporting the perceived usefulness reported here (Ahangari & Mohseni). Importantly, several recent studies connect metacognitive reading strategies with critical reading self-efficacy and motivation, suggesting plausible pathways by which strategy awareness feeds confidence and deeper textual engagement (e.g., mediation work with preservice teachers).

At the same time, the present findings also complicate a simple “more metacognition = better reading” narrative. First, the reliance on self-report (common to MARSİ-type studies) can inflate estimates of actual strategy deployment, particularly in contexts where English proficiency is uneven (Sheorey & Mokhtari, 2001). Second, there is evidence that perceived strategy use does not always correlate with performance, especially when linguistic constraints are large; some studies find non-significant or weak relations between self-reported strategy use and comprehension scores. Our result that evaluation strategies lag may therefore reflect both genuine regulatory gaps and measurement limits of self-report for higher-order, post-reading behaviors.

The discipline effect (social sciences > engineering) parallels work showing that disciplinary cultures and task demands shape strategy profiles. Research in Asian EFL contexts indicates that students required to critique arguments and handle discourse-rich texts report greater strategic regulation than peers in problem-set-heavy programs (Zhang & Seepho, 2013). Social sciences curricula typically emphasize argument evaluation, assumption-spotting, and evidence

appraisal—skills tightly coupled with metacognitive regulation—whereas engineering curricula may emphasize problem solving with fewer explicit opportunities for critical text interrogation. This interpretation is tentative, but it supports integrating discipline-sensitive strategy instruction (e.g., teaching how to read proofs, methods, or design specs critically in STEM).

The proficiency gradient in perceptions (higher proficiency → higher awareness and application) is consistent with the broader literature: higher L2 proficiency is associated with more flexible and efficient strategy orchestration, and with better calibration of when to slow down, reread, or question claims (Sheorey & Mokhtari, 2001; Malaysian/Thai university studies; mixed methods work in Iran). This echoes the reciprocal relationship view: better language skills afford more cognitive resources for regulation, while effective regulation in turn supports complex comprehension and critical appraisal.

The absence of gender differences in overall perceptions mirrors many large samples using MARSIS/SORS in tertiary settings, where gender effects are often negligible once proficiency and major are controlled (e.g., MARSIS-R invariance and regional university surveys). This suggests that curricular and proficiency factors may be more consequential targets than gendered programming.

Implications. Given the underuse of evaluation strategies, embedding explicit metacognitive instruction within English/reading courses appears warranted: (a) goal-setting and previewing checklists (planning), (b) comprehension monitoring prompts (monitoring), and (c) argument-evaluation routines (evaluation) mapped to Wallace & Wray's critical reading moves (identifying claims, warrants, evidence, counterargument). Discipline-specific adaptations—e.g., reading research methods critically in social sciences or design rationales in engineering—may help close disciplinary gaps. For lower-proficiency students, language-support plus strategy-scaffolding is advisable, given proficiency's moderating role.

Limitations and future work. Findings are based on self-report; triangulation with think-aloud, trace data during digital reading, or performance tasks would strengthen claims. Second, our results are cross-sectional; longitudinal or experimental designs could test whether targeted instruction increases evaluation behaviors and improves critical reading outcomes over time. Finally, expanding beyond one province and including more universities would enhance generalizability within Pakistan.

Overall, the pattern—high perceived usefulness, comparatively stronger monitoring, weaker evaluation, and differences by discipline and proficiency—converges with international EFL research while highlighting local leverage points for Pakistani higher education: explicit, discipline-aware metacognitive instruction that prioritizes evaluation for critical reading.

Conclusion and Recommendations

The findings of this study highlight that Pakistani university students demonstrate moderate to high awareness of metacognitive strategies, with monitoring strategies being the most commonly used, while evaluation strategies remain comparatively underutilized. Students also strongly perceived these strategies as beneficial for enhancing comprehension and critical thinking, indicating a positive attitude toward their role in academic reading. Importantly, while no significant gender differences were observed, variations emerged across academic disciplines and language proficiency levels. Students in social sciences and those with higher English proficiency reported greater awareness and use of metacognitive strategies compared to their peers in

engineering and with lower proficiency. These results suggest that language ability and disciplinary demands play a more influential role than gender in shaping students' strategic reading behaviors. Overall, the study underscores the critical role of metacognitive strategies in supporting deeper comprehension and critical reading among undergraduates. However, the limited application of evaluation strategies, which are essential for critical engagement with texts, highlights a gap that must be addressed through explicit pedagogical intervention.

Based on these findings, several recommendations can be made. First, explicit instruction in metacognitive strategies—particularly evaluation—should be integrated into English and reading courses at the tertiary level. Training modules may include activities that guide students in evaluating arguments, questioning assumptions, and assessing the strength of evidence, thereby fostering critical literacy. Second, discipline-specific adaptations of strategy instruction are needed, as the cognitive demands of texts vary across fields. For instance, while social sciences emphasize argumentative analysis, STEM disciplines require critical engagement with technical proofs and problem-solving tasks. Third, targeted support should be provided to students with lower English proficiency, combining language development with strategy training to maximize comprehension outcomes. Finally, teacher training programs should emphasize the importance of fostering metacognitive awareness, equipping educators to model and scaffold effective reading practices. By implementing these recommendations, universities in Pakistan can better prepare students to engage critically with complex texts, ultimately strengthening academic literacy and intellectual independence.

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