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SQ3R STRATEGY UTILIZATION AND ITS RELATIONSHIP WITH READING COMPREHENSION AMONG UNDERGRADUATE STUDENTS: A QUANTITATIVE CORRELATIONAL STUDY

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Abstract

This study examined the relationship between undergraduate students' utilization of the SQ3R (Survey, Question, Read, Recite, Review) reading strategy and their reading comprehension performance. A quantitative correlational design was employed, with 105 undergraduate students completing a structured questionnaire assessing SQ3R utilization and comprehension across three dimensions: Metacognitive Awareness (MCA), Cognitive Load Perception (CLP), and Comprehension and Schema Integration (CSI). Pearson correlation and multiple linear regression analyses revealed statistically significant positive associations between SQ3R use and all comprehension dimensions. The findings support SQ3R as an effective metacognitive and cognitive-load management strategy and recommend its integration into academic literacy programs to improve undergraduate reading proficiency.

Keywords: *SQ3R, reading comprehension, metacognition, cognitive load, undergraduate students.*

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INTRODUCTION

Reading comprehension is a foundational skill in higher education, underpinning students' ability to acquire, synthesize, and apply knowledge across disciplines. The rapid expansion of digital resources, open-access texts, and online learning platforms has made information more abundant than ever. Despite this, many undergraduate students struggle to comprehend complex texts deeply, often resorting to surface-level reading or rote memorization. These deficiencies not only limit academic performance but also hinder critical thinking, research skills, and lifelong learning capabilities. The gap between exposure to academic texts and effective comprehension is particularly pronounced in multilingual and culturally diverse contexts. Students often encounter unfamiliar vocabulary, complex sentence structures, and dense academic jargon, which increase cognitive load and reduce the efficiency of working memory. Moreover, the shift to digital learning introduces non-linear reading patterns, hyperlinked content, and multimedia elements that can disrupt traditional comprehension strategies. In such environments, students require structured and evidence-based reading strategies that support active engagement, planning, and monitoring of comprehension.

Among structured strategies, SQ3R has emerged as a widely recommended approach for improving reading comprehension. Originally developed by Robinson (1941), SQ3R provides a five-step framework Survey, Question, Read, Recite, Review that guides learners through systematic engagement with texts. The Survey stage encourages students to preview the text structure, headings, and subheadings to form an overview. The Question stage promotes the generation of targeted, higher-order questions that focus attention on key ideas. The Read stage involves active reading and encoding, while Recite reinforces retrieval of information through self-explanation. Finally, Review consolidates learning by summarizing and connecting new information with prior knowledge. Despite the well-documented benefits of SQ3R in experimental studies, there remains a lack of research examining students' self-directed, sustained utilization of the strategy in authentic academic contexts.

This study addresses these gaps by investigating whether undergraduate students who frequently employ SQ3R demonstrate higher reading

comprehension performance. Furthermore, it considers contemporary challenges in academic literacy, including digital reading environments, disciplinary-specific reading demands, and diverse learner profiles. By providing empirical evidence of the effectiveness of self-directed SQ3R use, this research contributes to theoretical understanding, pedagogical practice, and institutional policy on academic literacy development.

Despite the growing emphasis on reading comprehension in higher education, undergraduate students across disciplines continue to struggle with deep understanding of complex academic texts. While universities provide abundant resources and learning materials, students often face challenges in effectively processing, integrating, and retaining information. Factors contributing to this challenge include cognitive overload from dense texts, insufficient metacognitive regulation, lack of prior knowledge activation, and limited self-directed study strategies (Lin et al., 2025). These difficulties are further compounded by the increasing prevalence of digital and multimodal texts, where non-linear reading patterns, hyperlinks, and multimedia elements disrupt traditional comprehension methods, making engagement and synthesis more demanding for learners (Click, Think, Read, 2025; Pathways to Digital Reading Literacy, 2024).

Research indicates that a significant proportion of undergraduates fail to engage with texts beyond surface-level reading. They may read passively, focusing on memorization or skimming without critically evaluating content or connecting it to existing knowledge frameworks, which is associated with lower academic achievement and weaker critical thinking (Börekci & Yavuz, 2025). Engagement with metacognitive strategies remains uneven, particularly in digital learning environments where students must navigate larger volumes of information and multiple modalities (Sadallah, 2024; Börekci & Yavuz, 2025).

Moreover, students from multilingual or culturally diverse backgrounds face additional linguistic and cognitive challenges, increasing cognitive load and further hindering comprehension. The complex interplay of linguistic, cognitive, and motivational factors suggests that merely increasing access to texts is insufficient for improving reading outcomes (Shafiee Rad, 2025).

Structured reading strategies—particularly those that promote active engagement, self-regulated learning, and adaptation to digital environments—

are therefore essential. The SQ3R strategy, with its sequential stages of Survey, Question, Read, Recite, and Review, has been proposed as a framework to support these processes (Robinson, 1941). While prior studies demonstrate that guided instruction in SQ3R can improve comprehension outcomes (Cataraja, 2022; Jalil, 2024), evidence regarding students' independent, self-directed adoption of the strategy remains limited. Without sustained and intentional use, the potential benefits of SQ3R may not be fully realized, especially as learners engage with increasingly complex and multimodal academic texts in digital formats.

The current landscape underscores the need for empirical research that examines how students apply SQ3R autonomously in authentic academic contexts. Such research is crucial for understanding whether the strategy facilitates improved metacognitive awareness, effective cognitive load management, and schema integration—all of which are critical components of successful reading comprehension. This study seeks to address this need by investigating the correlation between SQ3R utilization and reading comprehension across multiple dimensions, providing insights into the practical implementation and impact of the strategy in higher education.moreover, it support in improving text comprehension skills, including identifying main ideas, details, vocabulary, and making inferences after the SQ3R method was implemented (SQ3R method was implemented Prasetia, A., Dwiniasih, D., & Pradeska, N. B. (2024)

RESEARCH GAP

Although structured reading strategies such as SQ3R have been studied for their potential to improve comprehension, the existing research exhibits several important gaps that this study aims to address. First, much of the literature on SQ3R focuses on experimental or quasi-experimental interventions that measure pre-post gains in comprehension following guided instruction (Cataraja, 2022; Jalil, 2024), but few studies have examined students' autonomous, self-directed use of SQ3R in authentic academic settings. Understanding how learners independently adopt and sustain this strategy outside controlled conditions is crucial, especially given the increasing demands

for self-regulated learning in higher education (Kuo & Lai, 2025).

Second, most existing studies emphasize single or narrow measures of comprehension, such as recall or literal understanding, rather than examining the multi-dimensional nature of reading comprehension involving metacognitive regulation, cognitive load management, and schema integration (Mokhtari & Reichard, 2002; Xie et al., 2024). Research on comprehensive assessments that incorporate these dimensions in relation to strategy use remains sparse, limiting our understanding of the mechanisms underlying reading success.

Third, there is a paucity of research that considers the interplay between digital reading environments and strategy effectiveness. With digital and multimodal texts becoming ubiquitous in university curricula, students must navigate hyperlinks, embedded media, and non-linear structures that challenge traditional reading approaches (Lim & Biswas, 2024; Zhang & Chen, 2025). Yet, few studies have examined whether strategies like SQ3R are effective in such contexts, or how they might be adapted for digital modalities (Patel, 2023).

Fourth, despite recognition that learners' affective and motivational factors (e.g., reading self-efficacy, anxiety, and engagement) influence strategy use and comprehension outcomes (Simons et al., 2023; Rahmati & Motallebzadeh, 2025), these variables are rarely integrated into empirical investigations of SQ3R. Omitting these moderating factors may obscure how and why students choose to engage with or abandon multi-step strategies.

Finally, much of the research to date has been conducted in narrow cultural or institutional contexts, limiting the generalizability of findings. There is a need for studies that incorporate more diverse student populations across geographical, linguistic, and disciplinary boundaries to assess the broader applicability of SQ3R as a reading strategy (Börekci & Yavuz, 2025).

THEORETICAL FRAMEWORK

A robust theoretical framework provides the foundation for understanding how the SQ3R reading strategy influences reading comprehension among undergraduate students. This study draws upon three interrelated theoretical perspectives: metacognitive theory, schema theory, and cognitive load theory. Together, these frameworks explain the mechanisms through which SQ3R facilitates comprehension, guiding both the conceptual model and the interpretation of results.

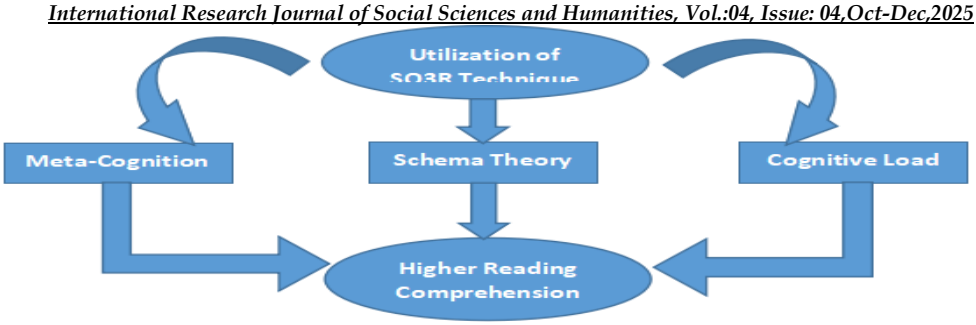
INTEGRATION OF THEORIES IN A CONCEPTUAL FRAMEWORK

Theoretical Component	*SQ3R Function*	*Expected Outcome*
Metacognition	*Activates planning, monitoring, and self-evaluation*	*Improved comprehension regulation and accuracy*
Schema Activation	*Connects prior knowledge to new information*	*Enhanced meaning-making and deeper understanding*
Cognitive Load Management	*Structures processing phases to reduce mental overload*	*Efficient working-memory use and sustained comprehension*

By integrating metacognitive, schema, and cognitive load perspectives, this study conceptualizes SQ3R as a multifaceted tool for enhancing reading comprehension (Figure 1). The framework posits that:

1. *SQ3R utilization (frequency and quality of application) positively influences metacognitive awareness, enabling learners to plan, monitor, and evaluate reading.*
2. *SQ3R utilization activates relevant schemata, supporting the integration of new information with prior knowledge.*
3. *SQ3R utilization optimizes cognitive load management, reducing extraneous processing demands and promoting efficient information processing.*
4. *These mechanisms collectively enhance reading comprehension across multiple dimensions: MCA, CLP, and CSI.*

Figure 1: Conceptual Framework of SQ3R Utilization and Reading Comprehension



- *SQ3R → Metacognitive Awareness → Improved Reading*
- *SQ3R → Schema Activation → Improved Reading*
- *SQ3R → Cognitive Load Management → Improved Reading*

This framework guides the study's research design, measurement, and interpretation, providing a clear theoretical rationale for hypothesizing positive correlations between SQ3R utilization and reading comprehension outcomes.

LITERATURE REVIEW

THEORETICAL FOUNDATIONS

MetacognitionTheory: *Metacognition, defined as the awareness and regulation of one's own cognitive processes, plays a central role in reading comprehension. It enables learners to plan their reading, monitor their understanding, and evaluate their learning outcomes (Flavell, 1979). Studies have consistently shown that metacognitive strategies enhance comprehension by fostering self-regulated learning and enabling students to identify areas requiring deeper focus (Mokhtari & Reichard, 2002; Aghaie & Zhang, 2012). The SQ3R strategy operationalizes metacognition through its structured stages. The Survey and Question phases facilitate planning, while the Read and Recite stages encourage monitoring and retrieval of information. Finally, the Review phase allows evaluation and consolidation of knowledge. Vargas and Robles (2024) demonstrated that students with higher metacognitive awareness used SQ3R more selectively and effectively, resulting in stronger comprehension outcomes. Conversely, students with poor metacognitive calibration failed to benefit from SQ3R, highlighting that the effectiveness of the strategy is mediated by learners' metacognitive skills.*

Schema theory: *posits that comprehension is guided by existing cognitive frameworks (schemata) that help integrate new information*

(Anderson, 1984). Activating relevant prior knowledge improves inference-making and facilitates deeper understanding of academic texts. SQ3R aligns with this principle by prompting learners to survey the text and generate questions before detailed reading, effectively activating prior schemata.

Recent studies confirm the importance of schema activation in reading comprehension. Elgazzar (2024) found that students who used SQ3R effectively demonstrated superior schema integration, enabling them to synthesize information from multiple sources. Similarly, Fang (2023) highlighted that discipline-specific schemata, such as scientific or historical frameworks, influence the depth of comprehension achieved by students. The Survey and Question stages of SQ3R are particularly effective in scaffolding such disciplinary reasoning.

Cognitive Load Theory: *Cognitive load theory (Sweller, 1988; van Merriënboer & Sweller, 2023) emphasizes that working memory is limited and must be managed carefully for effective learning. Cognitive load is divided into intrinsic, extraneous, and germane load. The structured nature of SQ3R reduces extraneous load by providing clear procedural guidance, while promoting germane load through retrieval practice and schema integration. Patel (2023) observed that in digital reading environments, students using SQ3R reported reduced cognitive overload, as the strategy provided clear guidance for processing complex texts. Similarly, Baxter (2025) emphasized that embedding structured procedural frameworks within instructional materials supports sustained comprehension and minimizes unnecessary cognitive effort.*

MOTIVATION, SELF-EFFICACY, AND AFFECTIVE FACTORS

Motivation and self-efficacy significantly influence students' adoption and sustained use of reading strategies. Bandura's (1997) theory of self-efficacy explains that students with higher confidence in their reading abilities are more likely to persist with effortful strategies like SQ3R. Simons et al. (2023) found that reading self-efficacy predicts both strategy adoption and comprehension growth, as students with high self-efficacy persisted through challenging readings and engaged fully with all stages of SQ3R.

Conversely, affective factors such as reading anxiety can hinder strategy

use. O'Donnell et al. (2023) reported that students with higher levels of reading anxiety tended to avoid multi-step strategies, relying instead on passive reading, which resulted in lower comprehension outcomes. These findings suggest that the effectiveness of SQ3R is moderated not only by cognitive skills but also by motivation and emotional factors.

DIGITAL AND DISCIPLINE-SPECIFIC LITERACY

The advent of digital learning has introduced complex reading environments that challenge traditional linear reading strategies. Hyperlinked scholarly articles, multimedia content, and e-textbooks require flexible navigation and selective reading strategies. Lee and Hancock (2024) found that students who rigidly adhered to the classic linear SQ3R steps in digital contexts demonstrated lower comprehension of interconnected ideas. In contrast, those who adapted SQ3R to a recursive, non-linear process performed better in synthesis and inference tasks.

Discipline-specific literacy further influences strategy effectiveness. Fang (2023) and Jensen (2024) note that reading in different disciplines requires distinct analytical skills: reading like a historian involves sourcing, contextualization, and critical evaluation, whereas reading like a scientist involves interpreting dense argumentation and evaluating empirical evidence. SQ3R's flexible structure allows students to adapt the strategy to specific disciplinary demands, but effectiveness depends on their ability to align the phases with domain-specific practices.

EMPIRICAL EVIDENCE FOR SQ3R EFFECTIVENESS

Multiple studies across secondary and higher education contexts demonstrate the positive impact of SQ3R on reading comprehension. Cataraja (2022) reported significant pre-post improvements in comprehension following SQ3R instruction. Jalil (2024) found that 8th-grade students using SQ3R exhibited enhanced retrieval and schema integration. Gurung (2025) observed that high school students using SQ3R outperformed peers using alternative reading strategies, including speed reading, both in comprehension and motivation.

However, correlational studies investigating self-directed use of SQ3R remain limited. Asyhari (2024) observed that while students could list the SQ3R steps, only a fraction consistently applied the complete protocol in their

coursework. Chen and Lin (2024) reported that engineering undergraduates selectively applied SQ3R for technical definitions and formulas but bypassed schema-activation phases for familiar material, demonstrating strategic selectivity in real-world settings. These findings underscore the importance of examining the relationship between self-directed SQ3R utilization and multidimensional reading comprehension.It was further emphasize by Jalil, A. (2024) that the by integrating SQ3Rtechnique into into teaching practices, it enhance vocabulary instruction through targeted discussions and assessments, and fosters collaborative learning environments to boost student reading comprehension..

METHODOLOGY

RESEARCH DESIGN

This study employed a quantitative correlational research design to examine the relationship between undergraduate students' self-directed utilization of the SQ3R reading strategy and their reading comprehension. Correlational designs are appropriate when investigating associations between variables without manipulating independent variables (Creswell & Creswell, 2018). This design allows for measurement of natural variations in SQ3R use and comprehension outcomes among students in authentic academic contexts, thereby increasing ecological validity.

*The study aimed to determine whether frequency and quality of SQ3R utilization predict differences in reading comprehension across three dimensions: Metacognitive Awareness (MCA)**,** Cognitive Load Perception (CLP)**,** and Comprehension and Schema Integration (CSI)**.** It further explored the relative contributions of each dimension to overall comprehension performance.*

POPULATION AND SAMPLE

*The population comprised undergraduate students enrolled in BS English and BS Commerce **programs** at a public university in Sindh, Pakistan. These programs were selected because students are routinely exposed to diverse academic texts, requiring critical reading and comprehension.*

A simple random sampling technique was used to select 105 students

from multiple course sections. This sampling method ensures that every student had an equal probability of selection, reducing selection bias and enhancing the generalizability of findings within the institutional context (Lohr, 2021).

Sample characteristics:

Variable	*Frequency*	*Percentage*
Gender	*Male: 55*	*52.4%*
	Female: 50	*47.6%*
Program	*BS English: 55*	*52.4%*
	BS Commerce: 50	*47.6%*

INSTRUMENTATION

SQ3R Utilization Questionnaire

A 20-item Likert-scale questionnaire was developed to measure students' utilization of the SQ3R strategy. The instrument covered the five stages: Survey, Question, Read, Recite, and Review. Each item was rated on a 5-point scale (1 = Never, 5 = Always). Higher scores indicated more frequent and effective utilization of the strategy.

The instrument was reviewed by five subject-matter experts for content validity. Items with less than 80% agreement were revised. A pilot study with 20 students confirmed internal consistency, yielding Cronbach's alpha = 0.89, indicating high reliability (Gliem & Gliem, 2003).

Reading Comprehension Measures

Reading comprehension was measured through three dimensions:

1. *Metacognitive Awareness (MCA) – 8 items adapted from Mokhtari and Reichard's (2002) MAI instrument, assessing students' planning, monitoring, and evaluation strategies during reading.*
2. *Cognitive Load Perception (CLP) – 6 items adapted from Paas and van Merriënboer's (1994) cognitive load questionnaire, assessing perceived mental effort during reading.*
3. *Comprehension and Schema Integration (CSI) – 6 items developed to evaluate students' ability to connect new information with prior knowledge and integrate concepts across texts.*

All items were rated on a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree). Pilot testing yielded Cronbach's alpha values of 0.86 (MCA), 0.84 (CLP), and 0.88 (CSI), indicating acceptable reliability.

DATA COLLECTION PROCEDURE

Ethical approval was obtained from the university's ***Institutional Review Board****. Participants received informed consent forms explaining the study's objectives, confidentiality assurances, and voluntary participation.*

Data collection occurred in two phases:

1. ***In-person administration*** *during class sessions, ensuring guidance for completion and clarifying any ambiguities.*
2. *Online administration via Google Forms for participants unable to attend in-person sessions.*

Completion time averaged 25–30 minutes per participant. All responses were anonymized, and no personally identifiable information was collected.

Data Analysis

Data were analyzed using SPSS Version 27. The analysis plan included:

1. *Descriptive statistics – means, standard deviations, and ranges for SQ3R utilization and comprehension dimensions.*
2. *Pearson correlation analysis – to determine the strength and direction of relationships between SQ3R use and MCA, CLP, and CSI.*
3. *Multiple linear regression – to examine the predictive power of SQ3R utilization on each comprehension dimension. Assumptions of normality, linearity, homoscedasticity, and absence of multicollinearity were checked.*
4. *Effect sizes – Cohen's d and R^2 values were calculated to evaluate the practical significance of findings (Cohen, 1988).*

Statistical significance was set at $p < .05$.

ETHICAL CONSIDERATIONS

The study followed standard ethical guidelines in educational research. Participation was voluntary, with the option to withdraw at any time. Data were anonymized and securely stored. Participants were informed that results would be reported in aggregate and used solely for research purposes.

RESULTS

This section presents the descriptive, correlational, and regression analyses examining the relationship between undergraduate students' SQ3R

utilization and reading comprehension dimensions: Metacognitive Awareness (MCA), Cognitive Load Perception (CLP), and Comprehension and Schema Integration (CSI).

DESCRIPTIVE STATISTICS

Descriptive statistics were computed for SQ3R utilization and the three comprehension dimensions. Results are summarized in ***Table 1****.*

Table 1: Descriptive Statistics of SQ3R and Reading Comprehension Measures

Variable	*N*	*Mean*	*SD*	*Minimum*	*Maximum*
SQ3R Utilization	*105*	*4.31*	*0.44*	*3.00*	*5.00*
MCA	*105*	*4.30*	*0.42*	*3.20*	*5.00*
CLP	*105*	*4.36*	*0.33*	*2.83*	*4.83*
CSI	*105*	*4.42*	*0.39*	*3.00*	*5.00*

The descriptive statistics indicate that students reported high levels of SQ3R utilization, with corresponding high scores on MCA, CLP, and CSI. Standard deviations were small, suggesting moderate variability in responses.

CORRELATION ANALYSIS

Pearson correlation coefficients were computed to examine the relationships between SQ3R utilization and comprehension dimensions. Results are shown in ***Table 2****.*

Table 2: Correlation Matrix of SQ3R and Comprehension Dimensions

Variable	*SQ3R*	*MCA*	*CLP*	*CSI*
SQ3R	*1*	*.43***	*.37***	*.30***
MCA	*.43***	*1*	*.52***	*.48***
CLP	*.37***	*.52***	*1*	*.41***
CSI	*.30***	*.48***	*.41***	*1*

Note: p < .01 (two-tailed)

SQ3R utilization is positively correlated with all three comprehension dimensions. The strongest relationship is with MCA (r = .43), indicating that higher SQ3R use is associated with enhanced metacognitive awareness. Moderate positive correlations with CLP and CSI suggest that the strategy also contributes to cognitive load management and effective schema integration.

REGRESSION ANALYSIS

To determine the predictive power of SQ3R utilization on comprehension dimensions, multiple linear regression analyses were conducted. SQ3R utilization was entered as the predictor, and each comprehension dimension served as a dependent variable. Results are presented in ***Tables 3 and 4****.*

Table 3: Regression Summary for SQ3R Predicting Comprehension Dimensions

Dependent Variable	*R*	*R²*	*Adjusted R²*	*F*	*p*
MCA	*.43*	*.18*	*.17*	*22.83*	*<.001*
CLP	*.37*	*.14*	*.13*	*16.91*	*<.001*
CSI	*.30*	*.09*	*.08*	*10.33*	*.002*

SQ3R utilization explains 18% of the variance in MCA, 14% in CLP, and 9% in CSI. All models are statistically significant, indicating that SQ3R use is a meaningful predictor of each comprehension dimension.

Table 4: Regression Coefficients for SQ3R Predicting Comprehension Dimensions

DependentVariable	*Predictor*	*B*	*SE B*	*β*	*t*	*p*
MCA	*SQ3R*	*0.61*	*0.13*	*.43*	*4.78*	*<.001*
CLP	*SQ3R*	*0.52*	*0.13*	*.37*	*4.11*	*<.001*
CSI	*SQ3R*	*0.45*	*0.14*	*.30*	*3.22*	*.002*

SQ3R utilization has a significant positive effect on all comprehension dimensions. The strongest standardized effect is on MCA (β = .43), followed by CLP (β = .37) and CSI (β = .30). These findings suggest that students who consistently apply SQ3R demonstrate higher metacognitive awareness, better management of cognitive load, and more effective schema integration.

In addition to the statistical associations reported above, the findings further demonstrate that students' strategic engagement with reading through SQ3R is meaningfully related to overall reading comprehension performance. The significant correlations between SQ3R utilization and all three comprehension dimensions Metacognitive Awareness (MCA), Cognitive Load Perception (CLP), and Comprehension and Schema Integration (CSI) indicate

that students who adopt structured reading behaviors are more effective in processing, organizing, and retaining academic information. Recent empirical studies support this interpretation, showing that learners who employ systematic reading strategies such as SQ3R achieve significantly higher comprehension outcomes compared to those who rely on unstructured or passive reading approaches (Winanti & Kartikawati, 2025; Hakiki et al., 2025). These results suggest that the correlations identified in the present study reflect a robust relationship between purposeful reading strategy use and the ability to comprehend complex academic texts, rather than isolated or incidental performance effects.

DISCUSSION

*The primary aim of this study was to examine the relationship between undergraduate students' utilization of the SQ3R reading strategy and multidimensional reading comprehension outcomes, including Metacognitive Awareness (MCA)**,** Cognitive Load Perception (CLP), and Comprehension and Schema Integration (CSI). The results indicate that SQ3R utilization is positively associated with all three dimensions, with the strongest relationship observed for MCA. These findings support theoretical expectations derived from metacognitive theory, schema theory, and cognitive load theory**.***

The significant correlations identified in this study are consistent with contemporary research demonstrating that structured reading strategies are strongly associated with improved reading comprehension across educational contexts. Recent studies indicate that SQ3R enhances comprehension by encouraging active engagement with text, systematic information processing, and reflective evaluation of understanding (Pratama et al., 2024). Learners who follow the sequential stages of SQ3R are more likely to read with purpose, monitor comprehension, and consolidate meaning through review, which directly supports deeper comprehension. Comparative research has further shown that students exposed to SQ3R-based instruction consistently outperform peers using conventional reading approaches, even in diverse instructional settings (Dumasig & Fernandez, 2025). The findings of the present study align with this emerging evidence, confirming that higher levels of SQ3R utilization correspond with stronger reading comprehension performance. This relationship underscores the role of strategic reading behaviors in facilitating

meaning construction, reducing superficial processing, and promoting sustained academic engagement with complex texts.

SQ3R AND METACOGNITIVE AWARENESS

The results demonstrate that students who regularly apply SQ3R exhibit higher metacognitive awareness. This finding is consistent with the theoretical premise that SQ3R encourages learners to plan, monitor, and evaluate their reading processes (Flavell, 1979; Mokhtari & Reichard, 2002). The Survey and Question stages require students to engage in planning and goal setting, while the Recite and Review stages promote self-monitoring and reflective evaluation.

Empirical studies corroborate these findings. Vargas and Robles (2024) reported that students who actively engaged with all SQ3R stages demonstrated improved self-regulation and were more accurate in identifying comprehension gaps. Similarly, Aghaie and Zhang (2012) found a strong correlation between metacognitive awareness and effective use of reading strategies, indicating that metacognition mediates the relationship between strategy use and comprehension outcomes. The present study extends these findings to a self-directed, naturalistic context, confirming that even without direct instruction, students who employ SQ3R maintain higher levels of metacognitive awareness.

SQ3R AND COGNITIVE LOAD MANAGEMENT

Cognitive load theory (Sweller, 1988; van Merriënboer & Sweller, 2023) explains why structured reading strategies like SQ3R improve comprehension. Students face intrinsic cognitive demands when processing dense or unfamiliar academic texts. SQ3R reduces extraneous load by guiding learners through manageable stages and enhancing germane load through retrieval practice and schema integration. The positive correlation between SQ3R utilization and CLP in this study indicates that students who consistently apply the strategy perceive lower cognitive strain and more efficient mental resource allocation during reading. Patel (2023) and Baxter (2025) observed similar results in digital learning environments, where structured reading steps facilitated information processing and minimized mental fatigue. These findings suggest that SQ3R not only improves comprehension outcomes but also optimizes learners' cognitive effort, making reading tasks more manageable.

SQ3R AND COMPREHENSION & SCHEMA INTEGRATION

The study also found a moderate positive relationship between SQ3R utilization and CSI, indicating that the strategy supports effective integration of new information with prior knowledge. Schema theory (Anderson, 1984) provides a theoretical explanation: the Survey and Question stages activate relevant schemata, while the Read, Recite, and Review stages consolidate and integrate new information. Elgazzar (2024) reported that students who effectively applied SQ3R demonstrated higher levels of inferential reasoning and were better able to synthesize information across multiple texts. Similarly, Fang (2023) highlighted that SQ3R supports discipline-specific schemata, enabling learners to navigate complex scientific, historical, or literary texts more effectively. The present study confirms that self-directed SQ3R use contributes to schema integration even in authentic academic contexts, reinforcing the strategy's practical value.The results align with previous experimental and quasi-experimental studies. Cataraja (2022) and Gurung (2025) reported improvements in comprehension following SQ3R instruction. However, most prior research focused on structured, teacher-led implementation. The present study extends these findings by demonstrating that self-directed SQ3R use, without continuous instructor intervention, is still associated with higher comprehension outcomes. This suggests that the strategy is robust and adaptable, supporting independent learning in higher education.

Moreover, the study supports findings from Chen and Lin (2024), who observed selective but effective use of SQ3R by undergraduates. The current study confirms that students can apply SQ3R independently across disciplines, provided they maintain adherence to the structured stages, particularly the planning (Survey, Question) and consolidation (Recite, Review) phases.

CONCLUSION

*This study examined the relationship between undergraduate students' self-directed utilization of the SQ3R reading strategy and their multidimensional reading comprehension outcomes, including Metacognitive Awareness (MCA)**,** Cognitive Load Perception (CLP)**,** and Comprehension and Schema Integration (CSI)**.** The findings reveal that SQ3R utilization is positively associated with all three dimensions, with the strongest effect observed on metacognitive awareness. These results provide robust empirical support for the theoretical*

premise that structured, sequential reading strategies enhance comprehension by promoting active engagement, strategic regulation, and efficient cognitive processing.

From a theoretical perspective, the study demonstrates the integrated utility of metacognitive, schema, and cognitive load frameworks in understanding reading strategy effectiveness. Metacognitive theory explains how students plan, monitor, and evaluate comprehension processes, while schema theory accounts for the role of prior knowledge in structuring understanding. Cognitive load theory clarifies how structured reading strategies reduce extraneous mental effort and facilitate efficient information processing. By operationalizing these theoretical constructs through SQ3R, the study illustrates how a single strategy can address multiple cognitive processes that are critical for effective reading. Practically, the findings underscore the importance of embedding SQ3R instruction within undergraduate curricula. Students benefit not only from explicit guidance in using the strategy but also from opportunities to practice self-directed application in diverse academic contexts. The positive association between SQ3R use and comprehension across MCA, CLP, and CSI dimensions indicates that the strategy fosters self-regulated, strategic, and reflective reading, which is essential for academic success and lifelong learning. Furthermore, adaptation of SQ3R for digital learning environments and discipline-specific texts enhances its applicability in contemporary educational settings. The study also highlights the role of student motivation, self-efficacy, and affective factors in strategy adoption. High self-efficacy and active engagement appear to reinforce the consistent use of SQ3R, suggesting that educational interventions should address both cognitive and affective dimensions of learning. Institutions can support this process through structured workshops, reflective exercises, peer collaboration, and integration of strategy use into assessment and feedback systems.

Despite its contributions, the study's limitations must be considered. The sample was drawn from a single institution, and data were collected through self-report measures, which may introduce bias. Future research should employ larger, multi-institutional samples, longitudinal designs, and objective

performance-based assessments to validate and extend the findings. Additionally, further exploration of digital adaptations, discipline-specific applications, and the moderating effects of motivation and reading anxiety is warranted.

In conclusion, this study provides compelling evidence that self-directed SQ3R utilization significantly enhances undergraduate reading comprehension across multiple dimensions. The strategy's ability to promote metacognitive awareness, manage cognitive load, and support schema integration makes it a versatile and effective tool for higher education learners. By integrating SQ3R into curricula, supporting its digital and disciplinary adaptation, and fostering metacognitive reflection, educators and institutions can enhance students' reading proficiency, academic performance, and lifelong learning skills. This research contributes both theoretically and practically, demonstrating how evidence-based reading strategies can bridge the gap between exposure to academic texts and meaningful comprehension in authentic learning contexts.

PEDAGOGICAL IMPLICATIONS

1. ***Integration of SQ3R into Academic Courses:*** *Instructors should integrate SQ3R explicitly into reading-intensive courses, such as literature, social sciences, and business studies. Rather than merely presenting the steps, educators should model the strategy, guide students through its application, and provide structured practice. For example, instructors can require students to generate questions during the Question stage and submit summaries during the Recite and Review phases. Such integration ensures that students not only understand the strategy but also develop habitual application skills.*
2. ***Metacognitive Skill Development:****The strong positive correlation between SQ3R utilization and MCA indicates that the strategy enhances metacognitive awareness. Educators should incorporate reflection activities, prompting students to evaluate their reading process, identify challenges, and adjust strategies accordingly. Techniques such as learning journals, think-aloud protocols, and guided self-assessment can further strengthen students' metacognitive regulation (Vargas & Robles, 2024).*
3. ***Digital Adaptation:*** *Given the increasing prevalence of e-learning*

platforms, online textbooks, and hyperlinked academic articles, institutions must provide guidance for applying SQ3R in digital contexts. Students should be trained to navigate non-linear texts while maintaining the sequential logic of the strategy. For instance, during the Survey stage, learners can scan digital headings and hyperlinks to construct an overview of the content, while using the Question phase to focus on relevant nodes of information. Patel (2023) emphasizes that such adaptations are critical for maintaining cognitive efficiency in digital learning environments.

4. ***Discipline-Specific Tailoring:****The study highlights the importance of aligning SQ3R with discipline-specific reading requirements. In STEM subjects, students may focus on procedural schemata and data interpretation, while in humanities, emphasis may be placed on conceptual analysis and contextual understanding. Curriculum designers should provide tailored examples demonstrating how each SQ3R phase can support comprehension in different disciplines (Fang, 2023; Jensen, 2024).*

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