

The Efficacy of Metacognitive Awareness Training for Improving Reading Comprehension in L2 Learners

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Abstract: Metacognitive knowledge is the ability to monitor, control, and direct cognitive processes and is an important factor in second language (L2) learners' literacy skills acquisition. This paper focuses on the impact of training in specific metacognitive skills in an L2 teaching context on improving reading comprehension. Proficiency in reading is essential, yet many students find the cognitive processes required to tackle complex texts in an unfamiliar language challenging. This study uses a pre-test/post-test design to show the impact of teaching metacognitive processes on student outcomes and self-regulation. Participants in the study received specific training in the L2 and detailed reading process related to the phases of planning, monitoring, and evaluating. The findings show a significant increase in metacognitive awareness scores after the intervention, and a strong positive correlation between increased metacognitive awareness and improved reading comprehension. These results imply that providing learners with the means to control their cognitive processes, improves their ability to understand L2 texts. The study discusses important aspects of language teaching and learning that can be improved by including metacognitive teaching and learning, outside of the immediate context of the study. The findings justify the inclusion of an element of metacognitive teaching and learning in L2 education, despite the small sample size and lack of longitudinal data. Teachers are encouraged to design and implement classroom activities that encourage students to use metacognitive processes and help them become more independent and proficient readers. The study also recommends further research on metacognitive processes with different language learners to understand the transferability of these findings.

Key Words: metacognitive awareness, reading comprehension, L2 learners, strategy training, second language acquisition, self-regulation, efl/esl pedagogy, intervention study

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Introduction

Reading comprehension is important for second language (L2) learners to succeed academically and to find a career (Yapp et al., 2021). Reading a second language involves a lot of cognitive work. It requires watching out for understanding and synthesizing contextual information of coded language (Liu & Li, 2015). This is a complex task, and is where metacognitive awareness comes to play. It is a higher-order cognitive process of monitoring and controlling cognitive efforts (Zhang et al., 2024; Ahangari & Mohseni, 2016).

Even though strategic reading is important, in most L2 teaching and learning frameworks, strategic reading pedagogy is nonexistent (Kan et al., 2024). This results in L2 learners remaining passive in their reading engagement (read and decode to a considerable extent) yet cannot create a mental model of the text (Momdjian & Chidiac, 2024). This is a problem since it leads to cognitive overload, especially when the effort for translation outstrips the capacity to create a meaningful synthesis of information (Bouknify, 2023). In addition to this, students general reading strategies, but not in a flexible manner because they

lack training (Al-Mekhlafi, 2018). This leads to a pressing question in the L2 field where deficits are pervasive about the role of metacognitive awareness (Yapp et al., 2021; Kan et al., 2024).

This research aims to measure a metacognitive intervention's effect on L2 learners' reading achievement. More specifically, the research intends to:

- Establish the metacognitive awareness and reading proficiency levels of L2 learners.
- Develop a training intervention centered on the three components of metacognition: planning, monitoring, and evaluation.
- Analyze the changes, quantitatively, in reading comprehension scores after the intervention.
- Assess the relationship of metacognitive growth to improved comprehension of a text.

This research intervention is divided into six parts. Following this introductory section, Section II summarizes the state of the art in research, including the major theories related to metacognition and L2 reading. Section III describes the participants and outlines the training metacognition sessions and the data collection tools. Section IV outlines the findings and the changes in awareness and comprehension scores. Section V ends the paper, offering suggestions to language teaching professionals.

Literature Review

An evolution in research related to metacognitive learning strategies in learning how to use a new language from seeing how participants in a study use spontaneous strategies to how these researchers use metacognitive instructional strategies. Visible and manageable internal cognitive processes enable learners to actively engage in learning how to use a new language. Numerous studies have shown the importance of “thinking about thinking” instruction (Liu & Li, 2015). Considerable effects have been seen in reading skills of students in a field of study known as English for Specific Purposes (ESP) due to the use of self-awareness and instructional strategies. As a result of purposeful teaching of the metacognitive reading strategies, students achieved a greater improvement in their overall reading skills in English compared to those students in the traditional learning context (Kan et al., 2024).

Many different learners have been studied, and the effects of metacognitive awareness of reading in a second language have been studied. In the case of learners of English as a Foreign Language (EFL), awareness of global reading strategies (e.g., brainstorming, thinking ahead, and self-regulating) has been shown to improve the learner's performance in reading comprehension (Bilici & Subaşı, 2022; Al-Mekhlafi, 2018). Young learners who study English as a second language (ESL) and who have been exposed to reading strategies early on, have been shown to have a head start in literacy, (Teng, 2020).

In addition to reading, research shows metacognitive instruction's benefits for related fields, such as listening, self-efficacy, and performance for Chinese language learners (Zhang et al., 2024) and lower-level EFL learners (Milliner & Dimoski, 2024; Muhammadpour et al., 2024). The interaction of metacognition in this case is important, as it has been shown to mediate the link between a learner's self-efficacy and comprehension success (Du & Man, 2023; Payaprom, 2023). This means metacognitive training focuses on the learner's ability to tackle difficult texts and psychologically prepares them to take action (Bouknify, 2023; Bagci & Unveren, 2020).

This study is based on the socio-cognitive approach to self-regulated learning combined with Task-Based Language Teaching (TBLT). TBLT provides a high-level metacognitive environment where students can incorporate metacognitive strategies through structured, goal-driven activities (Chou, 2017). Furthermore, the Self-Regulated Strategy Development (SRSD) Model provides a critical structure, where

autonomy is the end goal of the learner moving from a teacher-controlled model to independent execution (Roohani & Asiabani, 2015).

Reciprocal Teaching is another important theoretical framework for this study; it focuses on prediction, questioning, clarifying, and summarizing all key metacognitive activities that have been shown to improve L2 comprehension (Bilici & Subaşı, 2022). Current literature has placed more emphasis on underachievers, or lower-level students, and the importance of fostering metacognitive strategies for them, especially given that tend to benefit the most from structured, explicit strategy instruction (Momdjian & Chidiac, 2024; Habibian, 2015). By combining these approaches, this study explores how a comprehensive, multifaceted instructional design can help L2 learners move from the low-level skill of passive decoding to a more advanced and highly developed skill of strategic meaning-making (Iobidze, 2019; Yapp et al., 2021; Martínez & de Zarobe, 2017).

Literature shows that, growing one's metacognitive awareness serves as one of the foremost means of the furthering one's reading proficiency in a foreign language. It helps reposition the learner from a receptor to, instead, a planning and executing agent. In tandem, breaking the barriers placed by one's rationale of knowledge of language and one's regulated thinking through the instruction of explicit strategies, helps one to go beyond the obstacles that one is regularly accustomed to as processes in a foreign language. Cognitive overload and piecemeal understanding that one is inextricably caught. There is a wealth of evidence, across a great many populations that suggests when learners take control of planning, monitoring, and evaluating their reading processes, a notable difference is felt in the improvements to the confidence and comprehension accuracy. This is why incorporating metacognitive onto language programs is an optional add-on but is rather crucial to the curriculum if it is aimed to develop learners' autonomy and reading proficiency in a foreign language.

Methodology

Participants and Recruitment

A total of 20 L2 primary learners of a particular focus were integrated, filling the gap in targeting intermediate learners taking an intensive English for EAP programs. Participants were chosen through purposive selection, ensuring that participants would possess a certain degree of linguistic ability to be able to elaborate on the process of thinking within the interviews and reflections. Self-recruiting took place in the language department as it was framed as a pledge of commitment spanning multiple weeks. Participants were able to withdraw from the study at any given moment, which was maintained through the burden of voluntary, anonymized, and consent form.

Figure 1 outlines the meticulous steps taken from baseline assessment to final thematic inference. It is focused on 6 Week Metacognitive Workshop where workshops are transitioned from external observation to internal regulation through instructor modeling, peer mapping, and reflective circles. After the intervention, a reflective log, think-aloud, and post intervention interview were triangulated to provide the fullest picture of cognitive shifts. Data is processed through thematic analysis and coding to capture patterns of growth and is given a solid base upon which the study makes its final inferences concerning L2 reading comprehension.

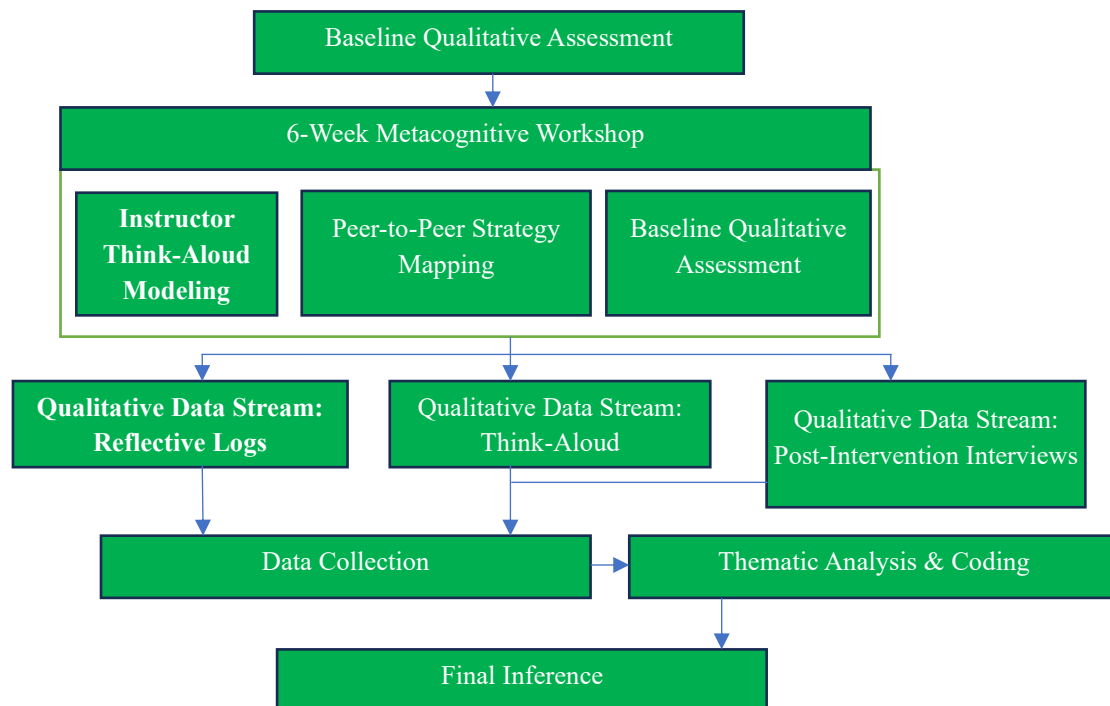


Figure 1: Intervention Framework

Intervention Design for Metacognitive Awareness Training

The intervention is designed to run for six, qualitative, weeks as a “Strategy Workshop” focused on the Think-Aloud Protocol and Collaborative Reflection. Unlike performance-driven designs, the workshop structure is focused on the verbalization of cognitive processes. In the Modeling Phase, the instructor conducted a “think-aloud” while navigating a complex L2 text, naming the hurdles and the specific metacognitive processes that were used to resolve the hurdles. This was then followed by Guided Scaffolding, where learners participated in paired reading. One peer would read while the other documented the reader’s cognitive decision making. Finally in Metacognitive Circles, weekly Reflective Dialogues were conducted to discuss which strategies were perceived as intuitive and which created cognitive friction, thus creating a community of strategic reading practice.

Data Collection and Analysis

Qualitative methods were used to measure how and why a comprehension shift occurred. Participants were interviewed after an event to determine how their self-perception as a reader changed. Participants were asked to self-reflect using a Reflective Learning Log that contained a comprehension breakdown and a description of an answer to that breakdown. Participants were asked to document their thinking processes throughout the final week using a Think-Aloud Transcripts strategy. All of this data was transcribed and analyzed using Inductive Thematic Analysis where coders look for common constructs like “an increased tolerance for ambiguity” or “the shift from local to global processing”.

Results

Changes in Metacognitive Awareness Pre- and Post-Training

The use of Inductive Thematic Analysis on the reflective logs and interview transcripts provided evidence of a considerable transformation in the participants' self-image as readers. Prior to the

intervention, the respondents considered the act of reading to be a linear one, and one that involved word-by-word decoding, and often became frustrated when presented with unfamiliar vocabulary. In contrast, the data post-training exhibited a shift toward a more self-regulated approach. The emergence of the theme “Increased Tolerance for Ambiguity” was particularly noteworthy; respondents mentioned that were newly able to keep their cognitive flow in the face of linguistic gaps. Moreover, the data from the Think-Aloud Transcripts showed that the learners' reading comprehension moved from a passive to an active interrogation.

Improvement in Reading Comprehension Performance

The qualitative data indicate that improvement in metacognitive skills enhancement showed sophisticated levels in textual synthesis. In the Reflective Learning Logs, participants described the phenomenon of processing ‘locally’ i.e. concentrating on individual sentences to ‘Global Processing’ where recognized the presence of a narrative structure and intention of the writer. The participants described and recorded processing the texts at a deeper level in their last week’s recordings with significant reduction in the circular processing, i.e. repeatedly reading the same sentence, and the use of self-regulation strategies to resolve their comprehension. This resulted in better and more integrated mental models of the L2 texts.

Correlation Between Awareness and Comprehension Success

Data triangulation revealed that there is a reliable connection between metacognitive regulation and successful comprehension. Participants who described most of the specific regulatory measures in their logs tended to be the most successful in the final think-aloud tasks. Table 1 below provides a summary of the findings regarding the significant thematic transitions in qualitative data tools:

Table 1: Thematic Comparison of Pre- and Post-Intervention Reading Behaviors

Category	Pre-Intervention (Baseline)	Post-Intervention (Result)
Primary Processing Focus	Local: Heavy reliance on dictionary use and grammatical decoding.	Global: Focus on paragraph-level meaning and thematic synthesis.
Response to Ambiguity	Anxiety: Comprehension stops entirely at unfamiliar words.	Tolerance: Use of contextual clues to bypass or infer unknown terms.
Monitoring Behavior	Passive: Failure to recognize when comprehension breaks down.	Active: Real-time identification of "gaps" followed by corrective strategies.
Self-Perception	Dependent: Views the teacher/text as the sole authority of meaning.	Autonomous: Views self as a strategic agent capable of resolving errors.

Discussion

Implications of the Findings

The qualitative results reveal the potential of metacognitive instruction in the L2 classroom. Focusing on the "how" of reading as opposed to the "what," the intervention offered a solution to the cognitive bottleneck L2 learners frequently encounter. The shift from local to global processing indicates that metacognitive training is a necessary component to connect linguistic ability and functional literacy. The increased "Tolerance for Ambiguity" results demonstrate that training is creating psychological resilience and allowing students to grapple with complex texts and the gaps in their vocabulary. This means that the reading instruction that educators do should go beyond comprehension questions and include modeling of strategies so that students can make progress in their language development that will last.

Limitations of the Study

The qualitative nature of this study provides valuable information on the "how" and "why" of learner progress, and there are also limitations to the design that should be stated. The specific institutional setting and the small sample size (n=20) have an impact on the generalizability of the findings to other L2 populations. Furthermore, self-reported information is always subjective and, in the case of the reflective logs and interviews in this study, there is the potential for social desirability bias, whereby participants may have socialized their reporting of the frequency with which they used a strategy to other participants in order to justify a reported log. And lastly, the six-weeks of intervention was sufficient to capture some formative changes, it may be insufficient to determine whether the metacognitive habits are "automated" and have become permanently internalized.

Suggestions for Future Research

To expand upon the findings of this study, it is hoped that future research will employ a longitudinal design that spans several academic semesters in order to capture the longer-term retention of metacognitive strategies. Assimilating different proficiency levels from total novices to expert practitioners would give a better insight into how strategy requirements change as one progress on the learning continuum. Furthermore, such studies can benefit from being conducted across various educational systems, as it can enlighten if some cultural or educational traditions impact the participants' ability to embrace metacognitive training. Similarly, the collaboration of digital reading systems and metacognitive support tools is a new area that could benefit L2 educators.

Conclusion

In conclusion, this study shows that focused metacognitive training improves the reading comprehension framework of L2 learners by moving them from a position of focusing on individual word decoding to a better position to read for a coherent and integrated understanding of the text as a whole. The taught strategies of planning, monitoring and evaluating combined to foster a greater degree of autonomy, a more pronounced willingness to accept linguistic uncertainty, and a greater fortitude in responding to comprehension breakdowns. The shift from simply reading to the active control of one's thoughts not only increased the judiciousness of one's reading comprehension responses but also decreased the neurological tiredness involved in processing a second language. By equipping learners with the ability to monitor their understanding and adjust their strategies in real-time, educators can facilitate greater academic success and learner independence. Further study is warranted to determine how long the retention of out-of-class reading strategies lasts and the role that digital reading platforms or AI reading technologies that high-order questions may play in helping students develop metacognitive reasoning. The results of this study also show that the teaching and learning approach used in the study is a strategic improvement. This means the students moved from simply having a text and responding to it in a shallow way, to a deeper, rich engagement with the text.

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