

Cultivating Young Minds: Metacognition's Impact on Reading Proficiency

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Abstract

Metacognition, or being aware of how you process information, is important for younger readers to progress in reading. This study investigates how metacognition helps children's reading development. The approach examines areas of thinking such as self-awareness, considering actions, and looking back to uncover how metacognition contributes to good reading skills. Furthermore, the study seeks to evaluate how well metacognitive approaches increase the reading abilities of young learners. The researchers examined findings from studies and theoretical models connected to metacognition and proficiency in reading. The study aims to provide a broad overview of the subject. The study uses a narrative review approach, carefully reading recent literature on metacognition and reading development. It examines various studies that address the approaches and results of metacognitive treatments on the reading skills of young children. The synthesis of data from various research studies reveals what helps young people build metacognitive skills and improve their reading proficiency. It examines how these findings might guide educators and policymakers and suggests possible treatments and methods for inclusion in schools. This evidence highlights how using metacognition can completely change education and suggests including it in teaching to produce thoughtful and independent readers.

Keywords: Metacognition, Reading Proficiency, Self-Regulation, Cognitive Development

Introduction

Teachers in early childhood find it difficult to help students read well, as many of the metacognitive approaches used in reading have yet to be fully adopted in the classroom. Studies have directly linked metacognition reading skills and involvement in reading. However, although Flavell and Vygotsky have offered important evidence, many curricula still strongly focus on rote decoding. The paper critically studies how metacognition improves reading skills by encouraging students aged 6–12 to think independently. It suggests that not using these strategies means missing out on a key resource for developing lasting literacy.

As Flavell (1979) and Brown (1978) explain, metacognition is using strategies to plan, keep track of and review your thinking. It prepares students to approach reading effectively by thinking and analyzing instead of only taking in information. For example, reading content first using background knowledge can help you learn; questioning and summarizing the material during and after reading improve your understanding and recall. This approach shifts reading into a self-driven task in which students recognize their doubts and change how they approach them (Palincsar & Brown, 1984). Without these rules, people will likely go through books rather than truly understand them (Norman et al., 2019).

Vygotsky's theory holds that metacognition involves other individuals in the learning process compared to learning independently. The theory dictates that when students collaborate, they

become more aware of metacognition and improve critical thinking skills. Through scaffolding, individuals are stimulated to accomplish more than they can; they plan and evaluate what they have learned. Azevedo (2020) argues that students must provide feedback and communicate for learning to occur and not just be subjected to the subject matter. The model shows that learning is better when there is collaborative questioning and mental training with others, not just individual dependence.

This review aims to gather evidence from studies to prove the mutually dependent interaction between metacognition and reading capacity among young readers. This review will analyze the theories behind metacognition for reading, show why the theory works, propose good methods of instruction, and explain how it impacts policies and practices. This paper aims to gather information about metacognition and how it benefits young and old readers by improving their reading skills.

Research Question: How do metacognitive strategies influence the reading proficiency of elementary-aged students?

Methods

The review uses articles, meta-analyses, and theories that have been peer-reviewed and published between 2010 and 2023. The studies included in this paper were found through ERIC, PsycINFO, PubMed, and Google Scholar databases. These studies used the search terms "metacognition," "reading comprehension," "elementary education," "self-regulation," and "cognitive development." 31 research papers were considered eligible in this study.

Inclusion Criteria

This review looked at 31 studies reviewed by experts and published in English between 2010 and 2023, focusing on children aged 6–12 and how they use metacognitive reading strategies. The studies selected included randomized control trials, quasi-experimental designs, theoretical models, and systematic reviews. The studies were chosen because they apply rigorous methods and are significant for understanding cognitive development. Azevedo (2020) explains that a combination of diverse approaches helps assess how effective literacy learning is in different educational contexts.

Data Analysis

A thematic synthesis was applied, where studies were classified based on the technique, such as reciprocal teaching and strategy instruction. It sorted participants between learners with disabilities and those in general education to study the benefits of adapted curricula. The impact of the intervention was closely measured using both objective tests and subjective inventories completed by participants, giving a clear picture of its influence on various groups of students.

Table 1. Organization of Metacognition Research Findings

Theme	Key Authors & Year	Main Focus
Foundational Theories	Flavell (1979); Brown (1978, 2015); Vygotsky (1978)	Origins and theory of metacognition and cognitive development
Metacognition & Reading	Baker & Brown (1984); Garner (1987); Palincsar & Brown (1984); Pressley & Afflerbach (1995); Nicolielo-Carrilho & Hage (2016); Hamdoud (2021)	Reading comprehension, strategy use, LD impacts

Metacognitive Tools & Interventions	Azevedo et al. (2016); Carretti et al. (2014); Moritz & Lysaker (2018); Moritz et al. (2018)	Instructional tools, cognitive therapy applications
Metacognitive Theories & Models	Schraw & Moshman (1995); Schraw (2009); Shea (2018); Nelson (2015); Coertjens (2018)	Theoretical frameworks and cognitive/metacognitive interactions
Measurement & Assessment	Fleming & Lau (2014); Double & Birney (2019); Schraw (2009); Norman et al. (2019)	How to measure metacognitive awareness, self-monitoring
Self-Regulated Learning (SRL)	Azevedo (2020); Quigley et al. (2018); Dweck (2006); Goh (2018)	SRL, mindset, second language learning, classroom implications
Cultural & Educational Implications	Souto-Manning (2019); Wolsey & Lapp (2011)	Multicultural pedagogy, 21st-century literacy and technology integration
Reading & Learning Disabilities	Swanson (1999); Nicolielo-Carrilho & Hage (2016); Khani et al. (2023)	Intervention outcomes for students with LD and EFL learners

Theoretical Foundations and Key Evidence of Metacognition in Reading

Education experts have established that metacognition is linked to improved reading abilities. His influential paper in 1979 described metacognition as involving both metacognitive knowledge and the practice of monitoring and managing our thinking. Expert readers review their understanding, pinpoint where they face difficulties, and use helpful strategies, showing each element of Flavell's model when reading (Shea, 2018).

Evidence-based practice supports that metacognitive strategy training benefits reading skills. According to Swanson (1999), incorporating metacognitive strategies into teaching significantly boosts reading comprehension among many groups of students. The review of many studies proved that guiding students to be aware of their thought processes led to better performance, which strongly shows the relationship between good reading skills and being aware of cognitive activities (Goh, 2018).

Palinscar and Brown (1984) and Garner (1987) found that the metacognitive discussion strategy of reciprocal teaching is effective. Students practice sharing the lead in discussions by summarizing, asking questions, providing explanations, and making predictions. Students learn how much they understand and learn to pay closer attention to how their understanding grows with this process (Palinscar & Brown, 1984). These approaches help students develop the mindset required for reading and learning independently. Researchers such as Baker and Brown (1984) show that these thinking skills can be kept and used again in different learning situations. The study by Coertjens (2018) suggests that students who received metacognitive training applied these skills in different subjects and kept showing growth in reading.

According to these studies, people can be taught to use metacognition, unlike those who naturally have it. Strategic teaching helps students manage their thinking, resulting in improved understanding. Supplying learners with these tools makes them more engaged and improves their reading abilities in all educational settings.

Applying Metacognitive Strategies in the Classroom

Applying metacognitive theory in the classroom requires teachers to structure lessons to help students show their thoughts. An effective approach is thinking aloud while reading, which helps students learn how to make sense of unclear writing or make predictions (Pressley &

Afflerbach, 1995). Following Vygotsky, it promotes assisted learning, where guidance is important. Furthermore, having a reading journal may encourage people to review their thoughts after reading, while checklists for goals are useful for planning before reading (Double et al., 2019). Strategies must be chosen and practiced properly for students' age, as focusing on them just once is likely to have only a short-term effect.

According to Palincsar & Brown (1984), reciprocal teaching is when students go through a planned discussion, supporting each other and boosting their mental engagement. The main strength comes from how it leads students to think about their learning by giving peers turns to lead, keeping everyone responsible, and increasing understanding in the group. Still, the approach works best when the teacher shows an example and practice is a regular habit; otherwise, students could become passive learners. Additionally, Schoenfeld (1987) highlights the role of post-reading reflection in developing students' thinking about their reading processes. Evaluating both their strategies and the results allows learners to improve in the future and design useful tools for analyzing literary texts. These approaches promote healthy reading habits and improve our ability to think strategically, which enhances our long-term reading ability.

Real-time feedback, motivating thought, and helping with utilizing techniques are some ways technological tools aid in metacognitive learning. When reading, students using technology can view their reading speed, highlight sections they have read a few times, or see a list of all the annotations made, helping them recognize their reading habits. According to Woolsey and Lapp (2011), self-assessment tools only work well with direct teaching and guided reflection, or they might just be used as reports to gather data. Teacher help and quality review cycles are key, as using digital tools alone could only result in unsubstantial reading practices.

Metacognitive skills are best developed in students when teachers use systematic methods. This style helps people assess their learning ability, try different approaches when confused, and strengthen their mental control. Moritz et al. believe these procedures support learning to solve problems independently and transfer skills to various subjects. Effectiveness depends on the teacher's role-modeling of the learning process and students participating actively. The lack of these elements could reduce the benefits, mainly for students with less experience in reflective learning. Therefore, how well tactics are carried out is just as crucial as the plan.

Theoretical Foundations and Key Evidence of Metacognition in Reading

The connection between metacognition and reading competency is firmly supported by research. According to Flavell (1979), metacognition means understanding one's thinking abilities and using that knowledge to control and regulate their thoughts. While reading, expert readers check their understanding, identify where they are confused, and apply techniques to clear up the confusion, displaying both aspects of Flavell's model (Shea, 2018).

Metacognitive strategy instruction, supported by empirical evidence, improves reading comprehension. A meta-analysis by Swanson (1999) demonstrated that teaching metacognitive skills leads to better reading comprehension among different groups of students. The study pointed out that helping students become aware of their mental processes during reading can improve their academic achievements and solidify the link between reading skills and cognitive awareness (Goh, 2018).

Palincsar & Brown (1984) and Garner (1987) conducted further studies that confirmed the success of reciprocal teaching, a strategy that focuses on guiding students to use metacognitive skills. Students switch roles in reciprocal teaching, acting as the leaders and discussing, questioning, and predicting the main points. Through this method, students better comprehend the material and become more aware of their learning process (Palincsar & Brown, 1984). They

develop in students the mental ability to read and learn on their own. The findings of Baker & Brown (1984) and similar studies have shown that sustained training of these skills allows students to apply them to various new learning projects. Coertjens (2018) also observed that students trained in metacognition could use these skills in many subjects and demonstrated lasting benefits in reading.

Foundational studies prove that metacognition can be created and adapted rather than unchangeable. In their model, Palincsar and Brown demonstrate how showing students how to self-question, summarize, and predict helps them participate more actively in reading. According to Swanson's research, using strategies for learning improves comprehension, particularly among students who need extra help. The success of teacher facilitation requires regular support and appropriate use at the appropriate time. Without adequate instructions or feedback, students might only apply strategies on the surface. Consequently, the effectiveness of metacognitive instruction depends on its proper implementation, the readiness of learners, and its ability to fit into overall literacy systems.

Applying Metacognitive Strategies in the Classroom

Metacognitive theory should be taught using structured, well-planned lessons. Educators are expected to introduce and demonstrate reading strategies throughout the reading process. For example, discussing how to set goals and guess outcomes before reading improves students' understanding of what they will read. Prompting yourself to question things helps you notice when the text is confusing. Reflecting on your reading after finishing helps your understanding stick and apply to other contexts. According to Double et al. (2019) and Pressley & Afflerbach (1995), these methods encourage students to become more engaged when reading. Thus, these tactics might not be fully internalized or used effectively without constant modeling and feedback.

Palincsar & Brown (1984) state that reciprocal teaching helps students think and regulate their learning through group effort and discussion. The process works well because it has structured role changes, meaning everyone must stay involved and responsible. Still, teachers must provide clear support for students to learn and always use the strategy. Structured reflections also help boost students' understanding of their learning by encouraging them to evaluate their techniques after reading. Schoenfeld (1987) correctly pointed out that reflecting while reading makes readers actively monitor their understanding, allowing them to learn more deeply and use strategies effectively in other subject areas.

Using technology makes learning to read more effective, as students receive instant feedback and can consider their reading methods and achievements. Woolsey & Lapp (2011) mention that text annotation tools and discussion platforms encourage more involved learning and help students monitor their activities. Still, teaching with technology is only effective when students are digitally prepared, and these resources are used with a teacher involved. A lack of organized support can cause students to mishandle information or become disinterested in their work. According to Moritz et al. (2018), properly using these tools helps students read strategically and use their learning skills in different areas of their education.

Literature Synthesis: Deepening the Understanding of Metacognition and Reading Comprehension

There have been many studies on the connection between metacognition and reading comprehension, revealing finer points about their relationship. Regulating mental tasks is key to successful reading and is called metacognitive control. This requires noticing how your mind works (metacognitive awareness) and finding ways to control your thoughts (metacognitive regulation).

Metacognition shows readers what to consider when exploring different texts, how to understand what they learn, and which elements influence their understanding. Strong metacognitive skills allow people to choose the best strategy for each type of reading, recognize their strengths and weaknesses, and focus more on learning (Hamdoud, 2021). Recognizing diminished understanding usually leads students to read again, ask for help, or use additional methods to understand the material better. Metacognitive regulation refers to planning how to organize your thinking while reading. Competent readers regularly check their grasp of the material and improve how they read and learn. Processes such as summarizing thoughts, raising further questions, and picturing information help keep your attention and focus.

More studies published recently support these connections. According to Khani et al. (2023), exercises designed to promote higher awareness of thinking improved how efficiently students read and their ability to manage themselves. Meanwhile, Carretti et al. (2014) also analyzed approaches for enhancing reading comprehension and found that teaching metacognition and working memory bettered students' text comprehension. They report that reading interventions are most helpful for students who find reading difficult. According to Nicolielo-Carrilho and Hage (2016), metacognitive approaches to reading help children with learning disabilities become better at reading, with better comprehension.

Problem Identification in Research and Practice

Both research and practice in education focus on finding optimal ways to help young minds develop their reading and thinking skills together. People agree on how essential metacognition and reading skills are. However, it is still difficult to turn this understanding into constant and effective ways to develop children's metacognition related to reading.

Recognizing the value of metacognition is often not enough; it is also challenging to smoothly integrate it into different lessons and for students with various needs. The relationship between specific mental strategies and early childhood reading needs to be examined with continuous research. This means understanding how metacognitive teaching can be adapted to each person's developmental stage and strengths. As demonstrated in this review, the objective of bringing together various studies is to solve this problem by supplying knowledge that helps shape new teaching strategies.

Current Developments and Future Directions in Metacognitive Interventions

Technological Integration

Applying technology in reading helps students become more aware of how they learn. Students can use e-books and online annotation tools to constantly check their learning and immediately know how they are doing (Wolsey & Lapp, 2011). This matches with new teaching strategies that let students learn differently, a trend that today's younger generation often prefers.

Focusing on Specific Learning Needs

Researchers are paying more attention to how well metacognitive strategies help individuals with reading difficulties. More importance is being placed on fostering a growth mindset (Dweck, 2006) by practicing metacognition. Supporting students in approaching difficulties as ways to learn may help them become more resilient and interested in examining their progress, leading to better reading achievements.

Cooperative Learning Spaces

Many researchers are studying how metacognition affects collaboration. According to Pressley & Afflerbach (1995) and Vygotsky's theories, peer conversations help students understand and learn from one another's thinking processes.

Connecting Neuroscience with Cultural Understanding

Neuroscientists can use advanced imaging techniques to explore the brain regions linked to metacognition during reading (Nelson, 2015). This situation could teach us more about metacognition and help develop specific interventions. Additionally, we need more research on how metacognitive teaching can support cultural diversity in the classroom. Because most existing research comes from Western backgrounds, it is essential to study how metacognitive practices evolve and could be supported in other cultures and languages (Souto-Manning, 2019). Metacognitive training could use intelligent tutoring and adaptive learning to provide targeted feedback and monitor learners' progress (Azevedo et al., 2016).

Challenges and Considerations in Teaching Metacognitive Reading

Individual Differences

Metacognition develops unevenly in different students. Certain people easily notice what is happening in their minds, but others need clear and detailed instructions. Accommodating different students within the same class can require a lot of time and effort (Pressley & Afflerbach, 1995).

Experiences and Feelings of Students

Some individuals might be unsure or even resistant at the beginning when encouraged to use metacognition. For students to participate in these activities, the classroom must be supportive and psychologically safe (Woolsey & Lapp, 2011). Emotional and social influences determine how much a student participates in metacognitive reflection.

Including metacognitive strategies throughout the curriculum can be problematic for teachers due to the packed schedule. Ensuring these practices are built into the system rather than added after the fact is crucial for lasting progress.

Assessment Difficulties

Determining how metacognitive skills are improving is not easy. Such tests often assess what you know rather than how you answer. Assessing metacognition accurately and constantly is still not easy since its features are fluid, and to do this, educators may use self-reflective writing, speaking out loud, or classroom observations (Schraw, 2009).

Most studies still indicate that metacognitive techniques in reading boost children's understanding of what they read. Professional training to solve these issues and use proven programs can ensure interventions are successful and sustainable everywhere. Research based on a thorough understanding of circumstances should guide steps taken in the future.

Ramifications for Professional Development and Educational Policy

Policy Implications

Since metacognition boosts reading competence and helps people learn for a lifetime, policymakers should integrate it into education guidelines. Measures that include teaching metacognitive skills must seek to develop students' ability to reflect on and control their learning. Resources should be used to create and spread instructional materials focusing on metacognition.

Professional Development

Metacognitive training should always be taught and maintained as part of teacher preparation and continuous development. Educators must understand the theory behind metacognition, know how to use it in many subjects and with various age groups, and have ways to observe

its progress. Supplying teachers with this information is vital to ensure students' metacognitive growth is directed effectively.

Assessment Reform

Various approaches to evaluation need to be tested and put into practice to support metacognition. Traditional exams are not always effective at promoting competency-based learning. The use of assessment tools to measure meta-thinking, learning strategies, and self-control in students can give us a better understanding of both their progress and how well metacognitive strategies are working.

Simply improving test scores is insufficient for adopting metacognition in policy and teacher training. Schools should ensure policies guide students to monitor themselves, create personal goals, and reflect on each subject area, not only reading. Teachers should learn how to use metacognitive approaches and include them in their daily teaching activities. This lack can cause students to collect knowledge rather than actively experience it. Teachers should give metacognition special attention, as it is essential for students to handle and thrive in the rapidly changing world.

Results and Discussion

Teaching explicit strategies for thinking enhances reading comprehension and self-regulation, according to Swanson (1999), Carretti et al. (2014), and Khani et al. (2023). They develop the ability to review their progress, recognize when they lose the thread, and try new ways to resume. Flavell (1979) suggested that metacognitive knowledge and regulation interaction support comprehension. Although the Metacognitive Awareness Inventory (MAI) claims to illuminate perceived improvements, it has risks due to self-report bias. As a result, the results of metacognitive training depend on the strength of the instruction received and measurable progress in cognitive and regulatory skills.

These approaches must be matched to the level of thinking skills students have developed. According to Pressley and Afflerbach (1995), older elementary pupils, especially fourth graders, have developed a higher level of self-management and can handle more abstract topics. This means that one teaching style cannot work well for everyone; younger students may benefit from learning strategies that involve a teacher's guidance, while older pupils can learn from following their progress. Educators should always evaluate students' mental readiness before introducing any interventions to ensure that strategies develop their understanding and independence at each stage of their development.

According to Vygotsky, learning to think well is strongly based on social interaction; this principle is also found in reciprocal teaching (Palincsar & Brown, 1984). Guided discussion in this way allows students to learn and strengthen metacognitive skills like summarizing, predicting, and clarifying. Participating in these teams helps peers practice balancing various demands and makes simple and complex aspects easier to understand. Reflecting on their learning makes students consider their thinking processes and modify their studies. Although many students gain confidence and exercise greater control over their learning with help, most teachers do not regularly practice or are not skilled at facilitating these changes.

Metacognitive strategies are known to be effective, but teachers often find it difficult to use them. Teachers must receive ongoing, high-quality training to apply interventions as planned. Evaluating how students' metacognitive processes develop is tricky as these skills are mostly assessed by self-reports, which are not always dependable. Implementing these approaches requires teachers to spend much time, sometimes at the expense of standard teaching requirements. Additionally, when strategies are seen as abstract or overly step-by-step, this

leads to student disengagement and less effective teaching. Progress in learning is slower in classrooms that lack solid support and regular feedback. Consequently, teachers must be properly trained, and the learning environment needs to be flexible and centered on students.

Limitations of the Reviewed Literature and This Review

Generalizability of Findings

Because many studies on metacognitive interventions are based on targeted sampling or specific places, the findings might not apply to students in more diverse populations or schools far from their familiar contexts. The outcomes of a study may be affected by the group's combination of age, income level, and reading experience.

Length of Intervention and the Long-Term Effects

Certain studies focus on how metacognitive training may have an impact in only a short time. Short-term successes are widely reported, but additional research is needed to understand if these interventions maintain or improve reading skills and the ability to use metacognitive skills over time.

Challenges with Assessment and Measurement

Metacognition is often hard to evaluate accurately. Responses on self-report instruments like the MAI can sometimes be affected by response bias (students might overstate or understate their skills). Observational methods and think-aloud protocols yield more detailed results, but it takes more time and effort to analyze them properly.

Limitations of Narrative Review

This narrative review compiles information from past studies but does not calculate the effect sizes through statistical analysis. While reviews are performed following set guidelines, someone must be able to interpret the research in question. Also, the limited scope of a review article means it cannot include all relevant research. The goal was to thoroughly present the important issues and results, yet did not involve extensive statistical analysis.

Researchers should carry out large-scale studies with different groups and keep improving assessment tools to advance the study and better understand how metacognitive interventions may help students in the long run.

Implications for Policy and Practice

Curriculum and Policy

The strong research on metacognition and reading proficiency suggests that teaching metacognitive skills should be standard in every literacy curriculum. Educational standards should encourage using metacognitive strategies, encouraging students to become smarter readers and be more in control of their education. The plan involves providing resources and supporting initiatives that help with metacognitive teaching.

Teacher Education and Professional Growth

Educators are crucial in helping students develop metacognitive abilities. As a result, those teaching future teachers should include both theoretical and practical aspects of metacognition in all pre-service and continuing training. Educators are expected to set the example with metacognitive thinking, give students time to think about their learning, and adapt the lesson to meet students' skills and needs.

Tailored and Age-Appropriate Teaching Methods

Since students develop independently, teachers must select and tailor appropriate metacognitive methods for each student. The main priority should be encouraging students to reflect on their learning and discuss their thoughts in a safe environment.

Future Research

Further research should examine how long early metacognitive interventions' positive or negative effects influence students' education. Studying how students think about their understanding influences their focus on reading tasks might uncover why some learners accomplish more than others. Evaluations must show how technology platforms can use metacognition, factoring in their design and how inclusive they are. Culturally responsive research is needed to design metacognitive approaches for diverse students. Valid and scalable assessments in the classroom will make it easier for teachers to assess metacognitive skills accurately and guide learning.

Conclusion

According to this narrative review, metacognition is crucial for helping young students become proficient readers. It establishes a connection between metacognition, better reading planning, and improved text comprehension. The review shows that students find it hard to be involved with readings or think deeply about them without learning how theory relates to evidence. Moreover, the literature validates explicit strategy teaching and reciprocal teaching as practical solutions that support students in these areas. The review could investigate whether reading approaches are equally good for all types of learners or when reading is done in different settings or formats.

Implementing metacognitive strategies is not easy, requiring custom lessons, teacher growth, and careful assessment, yet the rewards for student accomplishment are high. Metacognition should be carefully integrated into literacy instruction, as the study shows. Experts agree that teachers, policymakers, and researchers should make sure metacognitive skills are developed in students from an early educational stage.

Future studies could focus on understanding how metacognition develops in various learners and contexts, paying particular attention to long-term results and the use of technology. Developing metacognition helps students be thoughtful, independent, and able to manage the information they face today and in the future. Supporting younger readers in this manner inspires their interest in reading and learning for years to come.

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