

# **Metacognitive Strategy Use and Curriculum Design**

By

**Maria B. Cequeña**

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## Preface

This book took a long journey to its completion, and I am glad that finally, this book—an adaptation of my dissertation—came to fruition.

Chapter 1 presents a comprehensive review of Metacognitive Strategies and Its Impact on Metacognitive Awareness, Self-efficacy, Reading Performance, and Motivation. This chapter reviews the theoretical underpinning of metacognitive strategies to bridge theory and practice.

Chapter 2 is adopted from a journal article, a concise version of my dissertation published in the Philippine ESL journal in 2015. Its title is Metacognitive Strategy Use: Effects on Metacognitive Awareness, Self-efficacy, Reading Performance, and Motivation. This journal article is included in this book with permission from Dr. Leah Gustilo, the editor-in-chief of the journal.

Chapter 3 focuses on Social-Emotional Learning (CASEL, 2020) and its five core competencies: self-awareness, self-management, social awareness, relationship skills, and responsible decision-making. Each core competency is described with specific strategies used to develop each competency from credible sources. This section also presents two teaching approaches—cooperative learning and project-based learning—with sample learning activities that develop SEL's core competencies.

Chapter 4 is about designing a curriculum, which consists of the following topics: definitions of curriculum design, its types, and elements. The primary purpose of this section is to provide educators and curriculum developers with direction in choosing and designing the type of curriculum suited for their learners across levels.

Chapters 5 and 6 are modified versions of my dissertation. Chapter 5, Designing a Reading Program, reviews the nature of reading and reading skills, metacognitive strategies such as think-aloud and PLAN,

and illustrates how each technique can be used in processing information from a text.

Chapter 6 contains some lesson plans applying Metacognitive Strategies and SEL in teaching literary and non-journalistic texts. It aims to provide teachers insights on developing students' metacognitive skills to enable them to become self-regulated learners.

With the global COVID-19 pandemic that has escalated learning loss worldwide, this book presents a teaching method—metacognitive strategies—to help learners improve their comprehension and address this learning loss. The book discusses the theoretical underpinning of metacognitive strategy use and its effects on metacognitive awareness, self-efficacy, reading performance, and motivation. It also provides practical guidance on using metacognitive strategies in designing engaging learning activities that promote collaboration among learners.

The book will provide a valuable source of information for education students and teachers across many levels and a useful and practical reference for undergraduate and graduate education students.



# Introduction

Nowadays, with technological advancement dominating the global scene, reading has become a transformed activity. Students navigate the net, read electronic texts perfunctorily, and explore hyperlinks but end up hooked on multidimensional websites with video and audio clips of their favorite movie or music icons. With the dynamism of information communications technology, students spend more time surfing the net than reading books. To develop their genuine love for books, teachers should introduce them to exciting literature and teach them to negotiate meaning from the text through scaffolding and to find a connection to it through personal experiences. As Rosenblatt (1984) in (Probst, 1987) says, "Reading is a transaction, a two-way process, involving a reader and a text at a particular time under particular circumstances" (pp.1-2). The reader interacts with the author as they transact meaning from the text, developing a purpose or stance along a continuum from efferent to aesthetic. As the reader interprets a text, they bring prior knowledge and experiences, which the teacher should direct to lead them to the author's intended meaning.

As appreciation of a literary text is inculcated in the learner, they will more likely develop a positive attitude toward reading. Stevens et al. (1991) noted the significance of reading as the foundation of academic success in the future. Reading is a significant tool in learning all disciplines. Any academic discipline requires one's ability to read and comprehend to be promoted from one educational level to the next.

Another critical aspect of learning that most students need to acquire to make them succeed in their academic endeavors is metacognition, the ability to self-monitor or regulate their cognitive processes. Some of the self-monitoring techniques that research noted as effective in improving reading ability include checking one's comprehension of the text read through rereading, predicting, self-questioning, synthesizing

the writer's main points, encoding, annotating the writer's intended meaning, and pondering the text's relevance.

Several studies noted that developing a student's reading ability requires the teacher's ingenuity in making every student a self-regulated learner. A self-regulated learner can assess their learning. In the context of reading, a self-regulated learner can monitor their cognitive processes, is aware of whether or not comprehension occurs while reading, and can evaluate which strategies work best in information processing.

In any educational institution, there remains a question about what teaching methods and strategies will develop students' ability to regulate or control their cognitive processes for optimum learning. Many educators believe that there is no single method that will bring about positive academic results. However, research shows that teaching students metacognitive strategies develops their metacognition, or the ability to regulate and monitor their thinking processes, which significantly improves their comprehension and, eventually, their academic achievement.

With the efficacy of metacognitive strategies in facilitating students' comprehension, educators must incorporate metacognitive strategies into curriculum design. Curriculum design is a blueprint of learners' educational journey as it maps out learning outcomes (objectives/competencies), content, activities, assessments, and resources. The question arises of how including metacognitive strategies in the curriculum can enhance its design. The answer lies in recognizing that learning extends beyond mere absorption of facts. Educators should harness students' ability to plan, monitor, and regulate their thinking processes (metacognition) to help them navigate their academic pursuits independently. Imagine in a literature class, for instance, if students acquire metacognitive skills of setting goals, self-assessment, and reflective thinking, they will know which concepts are confusing

and apply fix-up strategies to understand them. This way, learners are empowered to make significant decisions for their learning.

The integration of metacognitive strategies into curriculum design is beneficial to learners because it develops social-emotional learning competencies (CASEL, 2020), such as (1) self-awareness – the ability to recognize their strengths and weaknesses as learners and the strategies that work well for their optimum learning; (2) self-management – the ability to set goals, plan their learning, and monitor their learning progress; (3) social awareness - the ability to understand other's perspectives; (4) social relationship skills – the ability to connect and work well with others through collaborative activities; (5) and responsible decision-making – the ability to make logical and ethical choices for their learning.

In conclusion, curriculum developers should consider infusing metacognitive strategy use into the school curriculum because it will equip learners with conceptual knowledge, life skills, and values they need to succeed in their academic and career goals.

This book discusses metacognition, metacognitive strategies, social-emotional learning, curriculum design, and reading programs and presents sample lesson plans that integrate metacognitive strategies and social-emotional learning (SEL).

# Chapter 1

## A Comprehensive Review of Metacognitive Strategies and Its Impact on Metacognitive Awareness, Self-efficacy, Reading Performance and Motivation

This chapter defines metacognition and traces its development. It also presents literature and studies from local and international publications that show the facilitative effects of metacognitive strategy use on students' metacognitive awareness, self-efficacy, reading comprehension, and reading motivation across levels.

### **Metacognition**

In the 50s and 60s, when schools predominantly used traditional teaching methods, their instruction focused on the subject matter. However, the influx of research in the field of education saw a significant shift from subject-centered education to learner-centered education. Empowering learners, as reflected in several studies, requires better and improved instruction to develop in every learner the ability to plan, monitor, and evaluate their learning, which reading scholars termed "metacognition."

The term "metacognition" is often linked with John Flavell (1979), who defined it as thinking about thinking. Metacognition comprises metacognitive knowledge and metacognitive experiences of regulation. Metacognitive knowledge pertains to knowledge gained about thinking processes and knowledge that can be employed to regulate cognitive processes. Metacognitive knowledge is further subdivided into three categories: knowledge of person, task, and strategy. The person category refers to one's beliefs about his or her strengths and weaknesses as cognitive processors of information and learning. The

task category includes knowledge about the nature of the task as well as the processing demands required from the learner. A concrete example of task knowledge is knowing that academic texts (expository essay, research report, etc.) require more time to read and higher cognitive demands than literary texts (short story, poetry, novel, etc.). Finally, the strategy category refers to the processes (strategies) that are likely to be effective in achieving goals in any academic undertaking. For instance, the child may believe that an excellent way to learn or retain much information from a text is to focus on the key points and restate them in their own words (Flavell, 1979). Hence, making the students become strategic learners capable of controlling their learning process requires awareness of these three types of knowledge such as task (e.g. reading expository texts considering text structures), strategy (rereading, summarizing, paraphrasing, visualizing information, etc.), and person (their characteristics as learners) (Armbruster, 1983).

Metacognitive experiences are likely to occur in situations that stimulate careful, highly conscious thinking where every step requires planning and evaluation. Metacognitive experiences can activate strategies aimed at either of two goals – cognitive, which aims at making cognitive progress, and metacognitive, which aims to monitor cognitive progress. Metacognitive experiences involve using metacognitive strategies or regulation (Brown, 1984). According to Brown, applying metacognition involves two sets of interconnected skills. First, it requires understanding specific skills, strategies, and resources required in completing a task. These strategies and skills include the following: determining main ideas, recalling information from memory, visualizing information or forming associations or images, using memory techniques (e.g. mnemonics), organizing material, notetaking or highlighting information, and utilizing test-taking techniques. Second, it entails one's awareness on how and when to use these skills and strategies to ensure the successful completion of a task.

Eggen and Kauchak (1997) define metacognition as awareness and regulation of cognitive processes. For them, these two types of metacognition, namely, meta-attention (awareness) and meta-memory (regulation), develop over time through one's experiences. Meta-attention refers to awareness and control of attention. For instance, a student starts taking notes to avoid losing track of the lecture. Meta-memory, on the other hand, pertains to a person's agency (regulation) or ability to regulate what memory strategies to use and how to use them for remembering information. Some memory strategies include scaffolding, SQ3R, mnemonics, chunking, classification, and organization.

Ormrod (2006, p.322) defines *metacognition* as "students' knowledge and beliefs regarding their cognitive processes and students' attempts to regulate their cognitive processes to maximize learning and memory." Ormrod recommended the following in the practices of metacognition:

1. Awareness of the limitations of one's own learning and memory capabilities
2. Knowing what specific learning task one can generally accomplish within a certain period
3. Determining which learning strategies are effective or ineffective in one's learning
4. Planning an approach one can use to learning tasks that will more likely produce good results
5. Utilizing effective learning strategies in processing texts and in retrieving previously stored information for optimum learning
6. Regulating one's knowledge and comprehension

Carell (1989) views metacognition in the context of reading. Metacognition refers to an individual's understanding of cognitive processes during reading. Metacognition is associated with two types of cognition, namely one's knowledge of strategies for learning from texts and the control (regulation) readers have (e.g. knowledge of what

strategies to use and how to use these strategies) while reading for various purposes (Carell, 1989; Ryder & Graves, 1994).

## **Metacognitive Strategies and Reading Comprehension**

Comprehension, as defined in Merriam Webster, is “the capacity for understanding fully.” Reading comprehension, then, refers to one’s ability to understand what he/she reads.

Students’ non-comprehension has been a common problem in some schools. To address this concern and to improve students’ comprehension, educators should provide explicit instruction of metacognitive strategies. Metacognitive reading strategies are applicable across many tasks, make readers aware of whether or not they understand what they are reading, and assist them in making decisions about what strategies to employ to facilitate comprehension (Weisberg, 1988).

O’Malley and Chamot (1990) identified metacognitive strategies for successful reading. These include planning which strategies to use, monitoring and assessing how effective their use is/was, and selecting a fix-up strategy if failure to understand any portion of the text has occurred. They propose specific metacognitive strategies: advanced organization, organizational planning, selective attention, self-monitoring, and self-evaluation. Advanced organization involves previewing the central ideas or concepts of the material, often by skimming, to link the previous knowledge to the new topic about to be learned. Organizational planning refers to planning the reading tasks like identifying the parts, the sequence, or main ideas that would aid in comprehending a text. Selective attention is deciding to attend to specific input aspects, often by scanning for keywords, concepts, or linguistic markers. Self-monitoring pertains to checking one’s comprehension during reading. Finally, self-evaluation requires assessing how well they have accomplished a reading or learning activity after completion (O’Malley & Chamot, 1990).

One of the powerful metacognitive strategies that facilitate comprehension is PLAN. PLAN, as defined by Caverly, Mandeville, and Nicholson (1995), is an acronym for a study-reading strategy with four distinct steps such as:

1. predicting content and text structure by mapping the author's ideas
2. locating known and unknown information to enable students to relate prior knowledge to the author's ideas
3. adding words or short phrases to their map to explain the concepts marked with question marks
4. noting their new understanding by revising the map if their predictions do not match the author's ideas

To illustrate how PLAN works, PLAN is a graphic organizer that helps students summarize the content of a reading selection. Using this metacognitive strategy requires specific steps to follow. First, the readers predict the selection content based on prior knowledge and experiences by looking at titles and subtitles. Then, they create a concept map, a representation of the author's ideas they predicted; they put question marks on unfamiliar concepts. Predicting and previewing text content will help the readers focus on what they are about to learn. Second, as they read the text, they locate familiar and unfamiliar concepts. They need to review their map by asking themselves how much background knowledge they have for each topic. If they know much about the topic, they should put a checkmark next to it. However, if they know little, they must put a question mark instead. This strategy will help them focus more while reading. Third, they add new information to their map to further explain concepts marked with question marks. Fourth, the note refers to the new understanding gained essential to complete the task. In this phase, the readers revise their concept maps by adding concepts identified in the selection to match the author's ideas (Caverly et al., 1995).



Caverly et al. (1995) experimented with the effect of PLAN, a reading strategy grounded in metacognition, on a sixth-grade class of low and average readers in a small rural U.S. community. To measure the effectiveness of PLAN, the experimenters provided both groups with reading instruction strategies with their social studies textbooks two days a week and a literature-based program for the other three days. The low-level readers were given guided and independent practice five days a week during their content mastery. The average-level readers went to other mastery classes. This program continued for twelve weeks. After the treatment period, significant differences between the low-level readers' and average readers' mean scores were evident. The greater gains made by low-level readers over those of the average readers were attributed to the application of PLAN, coupled with opportunities for guided and independent practice.

Think-aloud, on the other hand, is a technique in which the reader verbalizes their thoughts during reading. Some of the things, according to Vacca and Vacca (2001), which the reader can do during think-aloud include verbalizing a confusing point, making predictions, linking new information to prior knowledge, visualizing the events of a text read, and monitoring the strategy used while reading. However, only skilled readers are capable of doing these activities to construct meaning from a text. That is why modeling think-aloud is recommended for struggling readers.

Farr & Corner (2005) further added:

By engaging poor readers in coached practice in the think-aloud method, we provide them with the opportunity and guidance to choose practical, appropriate strategies to enhance reading comprehension. We are encouraging them to think about why and when to use specific strategies and providing them with the tools they need to successfully monitor their comprehension.  
(p.1)

In the study of Tregaskes and Daines (1989), they implemented an intervention program in 6th-grade Social Studies to increase reading comprehension levels of average ability students using five metacognitive strategies, namely: outlining, sentence summaries, self-interrogation, the KWL (What we know, what we want to find out and what we learned), and discourse as a mode of inquiry. The findings indicated improvement in reading comprehension skills and that instruction in the five metacognitive strategies improved the target group's reading comprehension abilities.

Cutiongco (1998) investigated the metacognitive strategies used by selected Grade Four students in comprehending written texts in English and Filipino. Thirty-one fourth-grade children enrolled in a laboratory school served as the respondents of the study. Communication Arts teachers identified the good and poor readers among them through a one-on-one informal assessment session to determine the reading ability of each pupil and to ascertain the accuracy of the classification of good and poor readers. Next, each participant was asked to think aloud about a text presented to determine the metacognitive strategies used. This think-aloud procedure was tape-recorded and transcribed. The findings revealed that children used eight categories of strategies during think-aloud such as: (1) literal retelling – recounting the story events in their own words; (2) inferencing- inferring cause-effect relationships, character's emotions and text's theme; (3) predicting - making predictions of what would occur next in the story or passage; (4) expressing a personal opinion - giving comments about the plot and characters' traits; (5) Imaging – citing a visual, auditory, or any concrete image in reference to a particular sense as a response to the text; (6) relating – connecting new information to background knowledge; (7) empathizing – putting oneself into the character's emotional experience; and (8) questioning – raising questions about story events and other aspects of the story. Of these eight categories, retelling story parts in their own words was the most common response of the children when they were asked to think aloud about a text. In addition, they tended to use "personal" strategies of expressing a personal opinion,

inferencing, and empathizing quite frequently. Good readers used more varied strategies and higher-order strategies like inferencing and imaging than poor readers. Conversely, poor readers experienced a great challenge in flexibly using strategies and in determining when to employ a specific strategy.

The study by Thomas and Barksdale–Ladd (2000) investigated the understanding and application of metacognition and executive control in reading among 10 undergraduate university students. Students from two undergraduate reading classes, originating from different states, underwent rigorous instruction in metacognitive strategies. Their comprehension and application of these strategies were documented through: 1) think-aloud analyses; 2) sharing metacognition journals outlining their outside reading habits; and 3) developing metacognitive strategies. Additionally, as an application of their acquired metacognitive skills, the university students tutored young readers, maintaining daily journals for all sessions. Finally, they participated in a case study involving suggested reading activities and diagnostic teaching strategies suitable for the young readers, demographics. From these data sources, intriguing results emerged. While the university students were aware of the metacognitive strategies that rendered them strategic readers, they predominantly employed these strategies in their personal reading. However, their application of these strategies in tutoring and case study situations was limited. It is possible that these students still require training in metacognitive instruction to effectively transfer such strategies to younger readers.

In a comparative study, Serran (2002) discovered that metacognitive strategies, such as reciprocal teaching, think-aloud, and buddy journals, equally yielded considerable improvements in the reading comprehension of urban, middle-class, and poor, ethnically mixed Black and Hispanic eighth graders who performed 1 to 4 years below their grade level on the McGraw-Hill Placement Test. Serran (2002) employed three heterogeneous classes in her study, which were taught different metacognitive strategies. Class 1 used buddy journals to

encourage writing and critical analysis. Class 2 employed the think-aloud strategy modeled by the teacher (researcher), requiring the students to question the text, predict information, summarize key ideas, connect to prior knowledge, and reread for clarification. In Class 3, the teacher used the reciprocal teaching strategy through scaffolding. The teacher modeled the strategy step by step, from making predictions about the title to generating questions and summarizing main points. Later on, as the students became used to the strategy, the teacher allowed them to interact with each other while serving as a facilitator of learning. The pretest and posttest results showed no statistical differences in the test scores of the three classes that used different metacognitive strategies. However, the combined use of all the metacognitive reading strategies substantially improved reading comprehension.

Abello (2003) discovered that students with high comprehension and high meta-comprehension performed remarkably better in reading comprehension compared to learners with low comprehension and low meta-comprehension. In his study, Abello examined possible relations in reading and writing performances of students with varying comprehension, meta-comprehension, and language abilities and determined the predictor variables of reading and writing. His respondents included 155 students from two private Catholic schools in Calamba, Laguna, comprising four comparison groups – (1) high comprehension-high meta-comprehension, (2) low comprehension-high meta-comprehension, (3) high comprehension-low meta-comprehension; and (4) low comprehension-low meta-comprehension. The findings of his study indicated that students with high comprehension-high meta-comprehension attained the highest scores in reading comprehension, while those with low comprehension-low meta-comprehension obtained the lowest marks. On written retelling, the low comprehension-low meta-comprehension group exhibited the slightest evidence of achievement in their writing performance. Moreover, the correlational report showed a positive and significant correlation between reading and writing. However, the stepwise

regression showed varying predictors of each of them. The reading comprehension predictors are first, comprehension; second, language proficiency; and third, meta-comprehension. The written retelling predictors are meta-comprehension and comprehension, respectively.

The studies previously reviewed on metacognitive strategies such as PLAN, think-aloud, buddy journals, reciprocal teaching strategy, outlining, summarizing, and KWL, among others, have proven the efficacy of metacognitive strategies on students' comprehension.

### **Teacher's Influence on Metacognition and Comprehension**

Paris (1990) has recognized the role of teachers in developing metacognitive skills. An effective way to develop the learner's cognitive monitoring is through modeling via scaffolding instruction (Vygotsky, 1986 cited in Cooper 1993). In this type of instruction, learners need much support from a more skilled person (usually a teacher). Scaffolding instruction involves four primary stages: explanation, modeling, support, and feedback.

Applying Vygotsky's learning strategy to reading, the teacher explains first the reading strategy to be employed and the importance of the said strategy. Next, the teacher models the strategy while reading a text. Then, through the teacher's support, the students apply the strategy modeled (guided practice). Finally, the teacher leads the class to self-evaluate the reading task and the strategy employed (feedback) necessary to improve further their application of the strategy learned. As the students demonstrate mastery in processing information from texts through guided practice, the teacher releases support and removes the learning aids to train the students for independent reading.

Ruddell and Unrau (2004), in their article, "Reading as Meaning-Construction Process: The Reader, the Text, and the Teacher," recognized the critical role of the teacher in facilitating students' collaborative transaction of meaning from texts in the classroom. As the

teacher initiates class interaction about the text, they draw from their prior knowledge and experiences some interesting facts concerning the nature of the reading process and the psychology of child or adolescent learners from which their plan of methods, approaches, strategies, and activities to be used are derived. In the same manner, as students are influenced by their affective (attitude and motivation toward reading) and cognitive domains (declarative, procedural, and conditional knowledge) in text processing, they, too, as educators, are guided by both affective (motivation to engage the students in reading) and cognitive conditions (declarative knowledge or knowledge of the reader's construction process, knowledge of teaching strategies, and metacognitive strategies which provide a system for self-monitoring and self-correction) during and after instruction. Metacognitive strategies, therefore, can be utilized by both students and teachers in classroom interaction. Students may engage in self-monitoring of their meaning construction process, while the teacher may also monitor their classroom instruction whether or not it facilitates students' comprehension of texts.

Various studies have proven the facilitative effects of metacognitive strategies on the reading comprehension of students across levels. The succeeding studies chronicle the facilitative effects of direct instruction of metacognitive strategies on the learners' reading abilities.

Beckman (2002) pointed out in her paper "Strategy Instruction," published in ERIC Digest, that many students' learning ability has increased through deliberate teaching of cognitive and metacognitive strategies. She added that direct instruction in these strategies is essential for students with learning problems. It has been noted that when teachers explicitly teach struggling students learning strategies and provide them enough encouragement, feedback, and opportunities to use these strategies, "students improve in their ability to process information, which, in turn, leads to improved learning" (p.3). But why is it important to make every student a strategic learner? Beckman

presented the outcomes of becoming strategic learners as follows (pp.3-4):

- Students trust their minds.
- Students know there is more than one right way to do things.
- They acknowledge their mistakes and try to rectify them.
- They evaluate their products and behavior.
- Memories are enhanced.
- Learning increases.
- Self-esteem increases.
- Students feel a sense of power.
- Students become more responsible.
- Work completion and accuracy improve.
- Students develop and use a personal study process.
- They know how to “try.”
- On-task time increases; students are more engaged.

In a study of Ee and Moore (2004), their notable finding is the significant relationship between self-regulated learning and achievement of high-achieving students. This proves that self-regulatory (metacognitive) strategies correlates with learners' achievement. Ee and Moore investigated the differences in the goal orientations and self-regulatory (metacognitive) strategies of students in high-achieving, average, and low-achieving classes in 53 Singapore schools. They also looked into whether classroom goal orientations and strategy-based (metacognitive) instruction of teachers differ in these three streams. Results revealed that females consistently scored higher than males in all dimensions; they know more and also used more of the self-regulatory strategies identified in the questionnaire. Regardless of classifications, students who reported knowledge of self-regulated learning also reported having a greater likelihood to use self-regulated learning. In the case of low-achieving students, their knowledge of self-regulated learning also had a positive influence on their achievement, but not through the usage of self-regulated (metacognitive) learning strategies. In addition, students' knowledge and use of self-regulated

learning mediated between task goal orientations and achievement for high and low-achieving students. However, no significant link was noted between usage of self-regulated learning and achievement for average-achieving students. Use of self-regulated learning by low-achieving classes negatively correlated with achievement. Conversely, a positive relationship occurred between self-regulated learning and the achievement of high-achieving students. Moreover, the study found that teachers' strategy-based instruction positively correlated with average-achieving students' knowledge and usage of self-regulated learning and low-achieving students' achievement but negatively correlated with high-achieving students' ego goal orientations. The negative relationship noted between strategy-based instruction and high-achieving students' goal orientations can be explained in the context of automaticity. High-achieving students had already reached automaticity in their self-regulated learning strategies and perhaps, they perceived teachers' strategy-based instruction insignificant.

Sharp and Ashby (2002) designed and implemented a reading program to improve the comprehension skills of middle and high school students. Collaborative learning, multiple intelligence strategies, thinking skills instruction, and metacognitive skills were used as instructional methods in the intervention program for less than half a year. Their study revealed positive results, such as a significant improvement in students' reading comprehension skills and a considerable increase in students' interest in reading.

Nwafor (2001) examined how effective study strategies can be utilized to enhance learning among African-American college and university students. She also investigated the factors that may affect students' use of strategies such as insufficient knowledge about the topic they are studying, lack of motivation to learn, the need for study skills training, and short attention spans. To facilitate learning, she recommended that students be exposed to effective study skills training programs such as effective time management, note-taking techniques to remember salient



information, test-taking techniques, comprehension-monitoring strategies, and essential learning and reading strategies.

Borromeo (1998) experimented on the effects of metacognitive learning strategies (MCLS) on third-year high school students' reading comprehension. Both control and experimental classes comprised one high-ability and one low-ability class. The control classes were taught using both old and new strategies, except metacognitive strategies. In contrast, the experimental classes were taught to employ metacognitive strategies in reading texts for two grading periods from June to November. The findings revealed that students exposed to MCLS (both high and low-ability classes) performed better in reading than their peers taught without MCLS. Furthermore, 93.26% of the respondents indicated that they liked MCLS.

EL-Hindi (1997) reported her study's findings on first-year college students' level of metacognitive awareness after receiving instruction in metacognitive strategies for reading and writing during a 6-week residential summer program in 1993. The metacognitive instruction involved teaching students specific strategies corresponding to the three phases. First, the planning stage for reading included identifying a purpose for reading, activating prior knowledge, previewing the text, and making predictions about a text. Planning strategies for writing, on the other hand, included identifying a purpose for writing, activating prior knowledge of a writing topic, and organizing ideas. Second, drafting strategies for reading included comprehension monitoring and self-questioning, strategies which Baker and Brown (1984) considered as crucial to effective reading. Self-questioning and monitoring were also taught as strategies to facilitate the drafting stage of writing. Learners were trained to self-question as they produced their texts and to monitor their progress at completing a writing task. Third, students were asked to accomplish reflective reading journal or "reading log" as part of the strategy instruction. The students used the reading logs to reflect on their thinking processes as they accomplished reading and writing tasks. In the context of reading, students were taught to

evaluate their understanding, react to the text they were reading, and relate the text to their prior experience. Within the context of writing, students were taught to evaluate their success as writers, react to their written texts considering readers' perspective, and analyze their texts holistically to see connections among ideas, if they flow seamlessly and cohesively.

The primary sources of data to assess metacognitive awareness for both reading and writing included the results from questionnaires and the reading log entries generated by students, which reflect their comments on their thoughts and actions as they completed their readings of chapters from their course text and articles written by contemporary writers for the course. For example, students would write down thoughts that came to mind when they first read the title or would use the reading log to comment on actions, such as referencing a dictionary, they would take when they encountered a word or phrase that was confusing. Students were asked to write in their reading logs each week. Reading logs were collected and photocopied each week by the instructors for analysis. The instructors provided feedback on the reading logs by writing marginal comments and questions. Students were given feedback and prompted to write critical commentaries on what they read, synthesize the ideas presented by the authors, and indicate how the text was connected to their own experiences. Questionnaires for metacognitive awareness included two 36-item instruments developed as part of a larger study (E1-Hindi, 1996) and used to assess students' metacognitive awareness before and after the metacognitive strategy instruction. One questionnaire assessed metacognitive knowledge for reading, and the other assessed metacognitive knowledge for writing. Each questionnaire was composed of four sets of questions. For each set of questions, students responded to a specific reading or writing scenario. For example, the first scenario described a hypothetical student about to read an assignment for a class. After reading the scenario, students answered this question, "If you were in this situation, would you..." for nine specific activities by checking "yes" or "no" for each activity. Some

examples of these nine activities include thinking of the reason for reading, writing down the reason for reading, plunging oneself into reading, thinking about one's knowledge about the topic, taking down notes, and counting the number of pages. Each activity was classified as either an activity that involved metacognition' (i.e., writing down a reason for doing the reading) or an activity that did not (i.e., just starting to read without doing anything). Each response received a specific score. A yes response to a metacognitive activity received a score of (1), and a yes response to a non-metacognitive activity received a score of 0. A no response to a non-metacognitive activity was given a score of one (1), and a no response to a metacognitive activity was rated 0. For each questionnaire, the scores in all the items were added to indicate a total score for metacognitive knowledge for reading and an overall score of metacognitive knowledge for writing.

Results from the responses to the questionnaires indicated a remarkable increase in students' metacognitive awareness of reading, as evidenced by the marked increase in the students' mean scores from 36.79 prior to the instruction of metacognitive strategies to 44.85 by the end of the instruction. A significant gain in metacognitive awareness for reading was evident based on the paired t-test result, ( $t(32) = 4.66, p = .00005$ ). Although scores on metacognitive awareness for reading increased significantly, scores for metacognitive awareness of writing increased but not at a statistically significant level. They obtained a mean score of 44.84, with a standard deviation of 8.85, on metacognitive awareness prior to instruction and after instruction, it significantly increased to  $M = 48.18$ , with a standard deviation of 6.84. Interesting results of log entries emerged, which revealed that the students engaged in highly strategic activity as they interacted with the texts and that they often used a particular metacognitive strategy.

Winser (1988) conducted a study to investigate the effect of metacognitive processes on 40 readers' reading processes. These 40 readers were comprised of an equal number of 2nd, 4th, 6th, 8th grade, and adults, and each subgroup was divided equally according to

reading proficiency. Each group was asked to read a narrative text orally. They were also asked to do silent reading of the same text. After their oral and silent reading, they were asked to think aloud about the processes that they used in correcting miscues. Their oral reading and think-aloud processes in both reading activities were taped. The Reading Miscue Inventory was used in analyzing their reading. Analyses of correction patterns and protocols showed substantial evidence of the readers' awareness and regulation of their reading processes. "Younger readers were not significantly less aware than older readers, but the less proficient were less flexible and less capable of utilizing appropriate strategies to remedy comprehension problems" (para. 3).

Miguel (1996) conducted an experimental study involving college freshmen, which established the effects of metacognitive strategies on reading and writing competence. The results showed a significant difference in mean gain scores of both the experimental and control groups. The experimental group significantly improved faster in their reading proficiency and writing competence.

In a study conducted by Stark (1995), involving 122 students in Grades 3, 6, and 8, she investigated the importance of metacognition on intellectual giftedness, the development of metacognition during childhood years, and the interaction of metacognitive and cognitive functioning. The subjects of her study were assessed on metacognitive and cognitive measures. The findings showed that across grade levels, intellectually gifted subjects scored higher than the average students on all measures of metacognition. Metacognitive processing increased considerably between ages 8 and 11 among gifted and average learners. However, in terms of metacognitive knowledge, results differed between ages 11 and 13. Finally, considering their mental age, no significant difference was noted between intellectually gifted and average students on metacognitive measures.

Arafat's (1996) descriptive study highlighted the importance of language competence in developing metacognitive skills. Arafat posited that good readers with high language competence were aware of their comprehension problems, monitored and evaluated their cognitive processes, and used fix-up strategies soon after realizing they had made a mistake. Conversely, poor readers with low language competence were less aware of their comprehension difficulties and rarely monitored their thinking processes.

Parcon (1995) investigated the effectiveness of advance organizers in developing metacognitive skills and reading comprehension of technological texts. Her subjects comprised 120 college freshmen with a middle-average IQ. The study revealed significant findings. The subjects (experimental group) who took the test with advance organizers performed remarkably better than those who did not use advance organizers. Considering all advance organizers used in the study, only the cognitive map correlated significantly with the development of metacognitive skills, such as stating purpose for reading, linking or connecting new events with prior knowledge, focusing attention on selected key information, correcting miscues while reading, and evaluating own performance. Finally, a significant relationship between the advance organizers used and the students' reading comprehension ability was noted.

Lenhart (1994) conducted a study on metacognitive monitoring strategies of third to sixth-grade proficient and less proficient readers. Lenhart reported that cognitive development is vital to learning metacognitive monitoring. In addition, proficient readers utilized more comprehension monitoring strategies than less proficient readers. Finally, developing metacognitive monitoring was influenced by cognitive development, instructional intervention, and parental input.

Osman (1992) experimented with the effects of think-ahead questions on students' reading performance. Results showed that the students provided with think-ahead questions scored higher on both facts and

problem-solving than those who never received think-ahead questions. Moreover, the students who were provided with an explanation for using think-ahead questions performed better on both immediate and delayed tests than the learners who did not.

Fan (1993) made a comprehensive investigation of the results of primary research studies, which examined the relationships between teaching metacognitive strategies and improving reading and vocabulary comprehension. Forty-one primary studies done between 1979 and 1991 were selected. These studies revealed interesting findings. The subjects who had received metacognitive reading strategy training considerably improved their reading comprehension from the 50th percentile to the 71st percentile. Similarly, average students trained to use metacognitive reading strategies showed significant improvement in their vocabulary comprehension from the 50th percentile to the 59th percentile.

In her experimental study, Reyes (2001), examined the effect of metacognitive strategies on grade VI pupils' reading awareness, self-perception, and reading performance. The experimental classes in three schools were taught similar lessons for seven weeks using metacognitive strategies, while the control classes were taught traditional methods as indicated in the teacher's manual. The researcher administered the following instruments as pretests and posttests: Researcher-Made Test (RMT) and Metropolitan Achievement Test (MAT) to measure reading performance; Metacognitive Reading Awareness Inventory (MRAI) to gauge pupils' level of consciousness in using metacognitive strategies; and Reader's Self-perception to assess the pupil's self-image as a reader. Interesting findings emerged in the study. The students' use of metacognitive strategies had a significant and positive effect on their reading performance and self-perception as readers in all three schools except for MAT and MRAI at one school. The overall effect of metacognitive strategies on the variables tested in the study was more effective at the other two schools.