questions monitored their learning better than did students who did not receive questions in the text. Walczyk and Hall (1989a) asked college students to read expository text with illustrative examples (presenting abstract principles in concrete terms) or embedded questions (encouraging self-questioning). If students received both examples and questions, they assessed their own comprehension more accurately (as indicated by a rating on a Likert-type scale) and made more accurate posttest predictions of test performance. In an informal classroom demonstration, Weir (1998) employed embedded questions to improve middle-school students’ reading comprehension. The questions were developed to facilitate interaction with texts, asking students to engage in activities such as making predictions, raising unanswered questions, or determining what is confusing. An interview indicated increased metacognitive awareness, and standardized test scores demonstrated greater than expected growth in reading comprehension from the beginning of the school year until the end of the school year.

Other researchers have found that strategy instruction can benefit from the inclusion of features designed to improve metacognition. For example, El-Hindi (1997) asked first-year college students from underrepresented minorities who were at risk for not completing their degree programs to use reflective journals to record their thought processes as they were taught metacognitive strategies for both reading and writing during a six-week summer residential program. The purpose of the reflective journals was to help make covert thought processes more overt and open to reflection and discussion. Pre- and postquestionnaires indicated a significant gain in students’ metacognitive awareness of reading at the end of the program. In addition, qualitative analysis of the reflective journal entries indicated a growth in the sophistication of the students’ metacognitive thought throughout the program.

Baumann, Seiffert-Kessell, and Jones (1992) used a think-aloud procedure to teach fourth-grade students a predict-verify strategy for reading, which included self-questioning, prediction, retelling, and rereading. These students were compared to students taught a prediction strategy (a comprehension monitoring strategy) and to a control group taught with traditional methods from the basal reader (such as introducing new vocabulary, activating prior knowledge, and summarizing) that did not include explicit metacognitive or monitoring instruction. The dependent measures included an error detection task, a comprehension monitoring questionnaire, and a modified cloze test. Both groups who received comprehension monitoring/metacognitive training demonstrated better comprehension monitoring abilities on all three dependent measures than did the control students. The students who received the think-aloud training exhibited better metacognitive awareness than did those taught only the strategy (as measured by the questionnaire and a qualitative interview).

DeWitz, Carr, and Patberg (1987) investigated the effectiveness of a cloze strategy with a self-monitoring checklist to induce fifth-grade students to integrate text with prior knowledge. In comparison to students taught a procedure to organize text information (a structured overview) and a control group, students taught the cloze strategy plus self-monitoring (either alone or in combination with a structured overview) improved their reading comprehension (as measured by both literal and inferential questions). These students also demonstrated greater metacognitive awareness as indicated by pre-post differences in responses to a metacognitive interview than did students who did not receive this instruction.

**Group-Based Interventions**

According to Paris and Winograd (1990), the reflection required to develop sophisticated metacognition can “come from within the individual or from other people” (p. 21). Thus, researchers have explored techniques for fostering metacognition that utilize interactions between learners to encourage the development of metacognitive thought (see also the chapter on cooperative learning by Slavin, Hurley, and Chamberlain and the chapter on sociocultural contexts for learning by John-Steiner and Mahn in this volume).

Perhaps the most well-known technique using peer-interaction is reciprocal teaching, an instructional model designed for teaching comprehension strategies in the context of a reading group (Brown & Palincsar, 1989; Palincsar & Brown, 1984). Students learn to make predictions during reading, to question themselves about the text, to seek clarification when confused, and to summarize content. Initially, the teacher models and explains the four strategies. Then the students take turns being the leader, the one who supervises the group’s use of the strategies during reading. Peers model to each other, and the teacher provides support on an as-needed basis, progressively becoming less involved. The underlying premise is that by participating in the group, the students eventually internalize the strategies, and the evidence is that reciprocal teaching is generally effective (Rosenshine & Meister, 1994).

Based on a theoretical model of dyadic cooperative learning focusing on the acquisition of cognitive (C), affective (A), metacognitive (M), and social (S) skills (CAMS), O’Dornell, Dansereau, Hall, and Rocklin (1987) asked college students to read textual material working in scripted dyads, in unscripted dyads, or as a group of individuals. Scripted dyads were given instructions in how to interact with their partners. Specifically, they were taught to take turns as they read, having one person summarize the text section while the other
tried to detect errors and omissions in the summary. O’Donnell et al. found that students who worked in dyads recalled more of the texts than individuals did. Scripted dyads, however, demonstrated greater metacognitive awareness in that they were more accurate in rating their performance than were the other students.

McInerney, McInerney, and Marsh (1997) explored the benefits of training in self-questioning within a cooperative learning context. College students received modeling from the instructor and practice in the use of higher order questions designed to induce metacognitive strategies in cooperative groups. These researchers reported better achievement as a result of the questioning training in the cooperative group as compared to a group who received traditional direct instruction.

King (1998; King, Staffieri, & Adelgais, 1998) developed the ASK to THINK—TEL WHY® model of peer tutoring to promote higher level thinking (including metacognition), which also featured training in questioning techniques. Learning partners are trained in communication skills, explanation and elaboration skills, question-asking skills, and skills of sequencing those questions. Students learn to use a variety of questions, including review questions, thinking questions, probing questions, hint questions, and metacognitive “thinking about thinking questions.” A preliminary investigation (King, 1997) indicated that thinking about thinking questions made a significant contribution to the effectiveness of the model in that students constructed more knowledge and increased their awareness of thinking processes.

Cooperative learning contexts also can be engineered so that the partner is a computer rather than another student. In a study by Salomon, Globerson, and Guterman (1989), a Computer Reading Partner presented four reading principles and metacognitive-like questions to seventh graders as they read texts. The reading principles taught by the Computer Reading Partner included generating inferences, identifying key sentences, creating images, and summarizing. Those students who worked with the Computer Reading Partner reported more mental effort, showed far better metacognitive reconstruction, and improved more in reading comprehension and quality of written essays than did those who received embedded factual or inferential questions in the text or who simply read the texts.

**General Recommendations for Instruction**

Sitko (1998) described the overall theme of metacognitive instruction as “making thinking visible.” To this end, she suggested incorporating introspection, on-line thinking-aloud protocols, and retrospective interviews or questionnaires into classroom practice. Fusco and Founta (1992) provided a shopping list of teaching techniques that they suggest are likely to foster the development of metacognition, including extended wait time, metacognitive questions, concept mapping, writing in journals, and think-aloud techniques in cooperative groups. They cautioned, however, that “unless these self-reflective strategies become a part of daily classroom tools, there is little chance that they will become students’ strategies” (p. 240). Winograd and Gaskins (1992) emphasized that “metacognition is most likely to be invoked when individuals are pursuing goals they consider important” (p. 232). Thus, they argued for authentic activities and thoughtful assessment in classrooms. In addition, they recommended a combination of teaching methods, including cooperative learning and direct explanation for strategy instruction (Duffy & Roehler, 1989; Roehler & Duffy, 1984).

Schraw (2001) encouraged teachers to use an instructional aid he calls the Strategy Evaluation Matrix (SEM) for the development of metacognitive knowledge related to strategy instruction. In this matrix, students list their accessible strategies and include information on How to Use, When to Use, and Why to Use each strategy. The idea is to foster the development of explicit declarative, procedural, and conditional knowledge about each strategy. In classroom practice a teacher can ask students to complete a SEM for strategies in their repertoire. Then the students can compare strategies in their matrix and compare their SEM to the matrices of other students. Schraw conceptualized the SEM as an aid to improve metacognitive knowledge and proposed the Regulatory Checklist (RC; modeled after King, 1991) for improving metacognitive control. The RC is a framework for self-questioning under the general categories of planning, monitoring, and evaluating. Schraw emphasized that providing students with the opportunity to practice and reflect is critical for successful implementation of these instructional aids.

Meichenbaum and Biemiller (1992) proposed that educational growth in a particular skill or content domain has two dimensions: the traditional curriculum sequence or “basic skills” dimension and the dimension of “classroom expertise,” where students overtly plan, monitor, and evaluate their work. To foster growth in the second dimension (the development of metacognition), they advised teachers to pay attention to pacing, to explicit labeling of task components, and to clear modeling of how to carry out tasks and problem solve. They cautioned that students should engage in tasks that vary along a range of complexity. Tasks that are too simple will not require extensive metacognitive processing, and excessively complex tasks will inhibit a student’s ability to self-talk metacognitively or to talk to others due to limits of attentional capacity.
CONCLUSIONS AND FUTURE DIRECTIONS

This chapter concludes with a brief summary of directions for future research. The first of these, the assessment of metacognition, is an issue with which researchers have been grappling for more than a decade. The second is the potential of advances in neuropsychology for increasing our understanding of metacognitive processes. The third is the complex role that metacognition plays in bilingualism and in the education of bilingual students. Finally, perhaps the most significant direction for future research for educational psychologists is the integration of metacognition into teacher preparation and the professional development of in-service teachers.

Assessment of Metacognition

In 1989 Ruth Garner and Patricia Alexander raised a set of unanswered questions about metacognition. One of these questions was how we can measure “knowing about knowing” more accurately. Unfortunately, more than a decade later, this question is as relevant today as ever. Garner (1988) described two prominent verbal report methods to externalize metacognitive knowledge—interviews and think-aloud protocols. Interviews are retrospective verbalizations; think-alouds are concurrent verbalizations. Verbal-report methods are vulnerable to several valid criticisms, one being the accessibility of metacognitive processes. As cognitive activity becomes more practiced and more automated, the associated metacognitive process, if present, is difficult to report (Garner, 1988). Another potential problem is the verbal facility or linguistic competence of the responder (Cornoldi, 1998; Garner, 1988). The responder, especially a child, may be mimicking the language of teachers rather than truly aware of complex cognitive processing.

Other concerns raised by Garner (1988) include the stability of responses over time and the accuracy of the report. One source of inaccuracy for interviews is that they take place at a time distant from the actual processing. One attempt to remedy this problem is to use concurrent think-alouds. This solution, however, creates its own problems because the process of describing the cognition as it occurs may actually disrupt the cognitive activity. Another methodology is to include hypothetical situations in the interview protocol to elicit responses, but considering hypothetical situations is likely to be more difficult for children. Another potential solution is to stimulate recall by having students comment as they watch a videotape of a previous cognitive activity. In this interview combined with stimulated recall method, the cognitive activity is real, not hypothetical, and although the interview is distant, vivid memory prompts are available in the videotape. In general, researchers recommend employing multiple methods, converging dependent measures (Cornoldi, 1998). In particular, Garner and Alexander (1989) suggested combining verbal report techniques with behavior- or performance-based methods.

Cornoldi (1998) identified another limitation to the study of metacognition: the low psychometric properties of available scales. What measures are currently available for the measurement of metacognition in classroom contexts? One well-known broad-based measure of study skills is the Learning and Study Strategies Inventory (LASSI; Weinstein, Zimmerman, & Palmer, 1988). The LASSI was developed for undergraduate learning-to-learn or study skills courses with the purpose of diagnosing student strengths and weaknesses. It is a 77-item, self-report, Likert-type scale, with 10 subscales (anxiety, attitude, concentration, information processing, motivation, time management, selecting main ideas, self-testing, study aids, and test strategies). A high school version of the LASSI has also been developed. None of the subscales, however, specifically targets metacognition (although some of the questions in the self-testing subscale address monitoring skills).

The Motivated Strategies for Learning Questionnaire (MSLQ) developed by Pintrich, Smith, Garcia, and McKeechie (1993) to assess motivation and use of learning strategies by college students does include a subscale for metacognition. It is a self-report instrument containing 81 items, using a 7-point Likert-type scale, 1 (not at all true of me) to 7 (very true of me). The MSLQ has Motivational scales (31 items) and Learning Strategies scales (50 items, which assess cognitive, metacognitive, and resource management strategies). Pintrich et al. make a clear distinction between cognitive and metacognitive activities. Cognitive strategies include rehearsal, elaboration, organization, and critical thinking; metacognitive strategies include planning, monitoring, and regulating. Resource management refers to managing time and the study environment, the regulation of effort, peer learning, and help-seeking behavior. The authors report that scale reliabilities are “robust”, particularly for the motivational scales (a “reasonable alpha” is reported for the metacognitive strategies subscale).

Schraw and Dennison (1994) developed the Metacognitive Awareness Inventory (MAI) to measure the knowledge of cognition and the regulation of cognition in adolescents and adults. Using a method derived from the multidimensional scaling literature, ratings for each of the 52 items in the MAI are made on a 100-mm scale. The students are asked to draw a slash across the rating scale at a point that best represents how true or false each statement is about them (the left end indicates that the statement is true; the right end indicates that the statement is false). Factor analysis indicated that the
two factors (knowledge and regulation of metacognition) were reliable and intercorrelated.

Utilizing the conceptual framework of Sternberg’s componential theory of intelligence, Armour-Thomas and Haynes (1988) developed a scale to measure metacognition in problem solving for high school students called the Student Thinking About Problem Solving Scale (STAPSS). The STAPSS is a 37-item Likert-type scale, ranging from 1 (not at all like me) to 7 (extremely like me). A factor analysis revealed six factors—Planning, Organizing, Accommodating, Evaluating, Strategizing, and Recapitulating. Armour-Thomas and Haynes reported the reliability to be “acceptable” and to have “modest” predictive validity with SAT scores.

Jacobs and Paris (1987) designed a multiple-choice instrument to assess third and fifth graders’ metacognitive knowledge about reading, the Index of Reading Awareness (IRA). The IRA contains questions to measure evaluation, planning, and regulation and also questions to measure conditional knowledge about reading strategies. There are a total of 20 questions, each with three alternatives—inappropriate answer (0 points), partially adequate (1 point), strategic response (2 points)—so scores can range from 0 to 40 points.

Everson and Tobias (2001) developed a measure of metacognitive word knowledge called the Knowledge Monitoring Ability (KMA). The KMA measures the difference between college students’ estimates of knowledge and their actual knowledge. Students are given a list of vocabulary words in a content domain and are asked to indicate the words that they know and those that they do not know. This estimate of knowledge is followed by a vocabulary test on the same words. The accurate metacognitive judgments of college students (items that they said they knew and did and items that they said they did not know and did not) are positively correlated with standardized measures of language skills. There is also some evidence that KMA is related to college grade point average.

Although there have been some advances in the measurement of metacognition, more work is needed establishing the reliability and validity of the available measures. In addition, there are relatively few measures developed for school-aged children. Finally, teachers need efficient, easy-to-use assessments for classroom purposes. There is some evidence, however, that researchers are turning their attention to issues related to the measurement of metacognition (for more information, see Schraw & Impara, 2000).

Promise of Neuropsychology

A natural question for neuropsychologists to ask is where executive control processes might be situated in the brain. Darling, Della Sala, Gray, and Trivelli (1998) reviewed the search for the site of executive control in the human brain and found that as early as 1876, Ferrier attributed an executive function to the prefrontal lobes. There are clear indications that the prefrontal lobes are critical to higher order functioning. For example, the percentage of prefrontal cortex in humans “represents an enormous increase” even in comparison to chimps (p. 60). Moreover, the prefrontal lobe is one of the last portions of the brain to mature. There are two primary types of research evidence supporting the role of the prefrontal lobe in metacognition: research on individuals with brain damage and, given relatively recent advances in techniques, research on normally functioning individuals.

Shimamura (1994) described examples of neurological disorders that cause impairment in metacognition. For instance, individuals with Korsakoff’s syndrome exhibit poor knowledge of memory strategies and an impaired feeling of knowing (a failure to be aware of what they knew and did not know). They exhibit knowledge of facts but cannot evaluate the accuracy of that knowledge. Other patients with amnesia do not necessarily exhibit this impairment in metamemory, but it has been found in other patients with widespread cortical damage such as in Alzheimer’s patients. Individuals with frontal lobe lesions also display feeling-of-knowing problems, but individuals with Korsakoff’s syndrome exhibit the most extensive metacognitive limitations.

Darling et al. (1998) remarked that the “basis for location of the central executive within the prefrontal lobe in humans has been strengthened by work that has used modern brain imaging techniques” (p. 78). Brain imagery studies provide evidence that the frontal cortex is involved as normal people complete tasks that require reflection. Although the results hold promise, Darling et al. indicated that more research is needed and cautioned that there may not be a single site for executive control in the brain.

Metacognition and Bilingualism

In recent years there has been considerable interest in the psychology of bilingualism. For example, Francis (1999) conducted a quantitative and qualitative review of over 100 cognitive studies of language integration in bilingual samples and reached the conclusion that “the two languages of a bilingual tap a common semantic-conceptual system” (p. 214). Why might it be beneficial to be bilingual? Some have argued that bilinguals would have increased opportunity to reflect on the nature of language as a result of their experiences with two languages (Vygotsky, 1986), and linguists have found evidence of greater metalinguistic knowledge in bilinguals.
than in monolinguals (Lambert, 1981). Bialystok and Ryan (1985) reported that children who do well in metalinguistic tasks typically learn also to read quickly and easily. They suggested that “using more than one language may alert the child to the structure of form-meaning relation and promote the ability to deliberately consider these separate aspects of propositions” (p. 217).

Summarizing a program of research conducted in school contexts, Garcia, Jimenez, and Pearson (1998) reported that children use knowledge and strategies developed in reading and writing in one language to facilitate literacy in a second language. Successful bilingual readers mention specific metacognitive strategies that could be transferred from one language to another. In contrast, monolingual readers do not identify as many comprehension strategies as do bilingual readers. Garcia, Jimenez, and Pearson’s (1998) analysis indicated that a developmental advantage for bilinguals in literacy tasks surfaces in preschool and seems to disappear with schooling. They noted, however, that there are few instructional programs “explicitly designed to build upon, enhance, and promote the cognitive and metalinguistic advantage of bilingual children” (p. 198). They suggested that increased metacognitive awareness is not an automatic outcome of bilingualism or bilingual education and recommended that educators focus on instruction that fosters metacognitive awareness and strategic reading.

Goh (1997) examined the metacognition of 40 college-aged English as a Second Language (ESL) learners from the People’s Republic of China. The students were asked to keep a diary as they learned English and were prompted by questions to reflect on their learning. Using categories in the metacognitive literature, the diary entries were classified into person knowledge, task knowledge, and strategic knowledge. The analysis of the entries revealed that the students had a clear understanding about their own role and performance as second-language listeners, about the demands and procedures of second-language listening, and about strategies for listening. Drawing on the results of this study, Goh advocated the incorporation of process-based discussions about strategy use and beliefs into ESL curriculum.

Carrell, Gajdusek, and Wise (2001) proposed that what is important in learning to read in a second language is metacognition about strategies, specifically, having a strategy repertoire and knowing when and how to use the strategies. They analyzed second language reading strategies training studies in terms of the amount of metacognitive training provided in the instruction. Their analysis revealed the presence or absence of the following metacognitive components: declarative knowledge (what and why of strategy use), procedural knowledge (how to use a strategy), conditional knowledge (when and where to use), and a regulation component of evaluating or monitoring strategy implementation. Their review indicated a significant positive effect of strategy training when compared to control or traditional approaches, but the available data did not reveal which metacognitive components are critical to successful language learning.

Ellis and Zimmerman (2001) described research demonstrating that instruction in self-monitoring led to improvements in the pronunciation of native and nonnative speakers of English enrolled in a remedial speech course. The self-monitoring instruction included teaching students to self-observe, self-evaluate, and self-repair more carefully. They posited that there is a “growing body of research indicating that linguistic novices are handicapped by their inability to self-monitor accurately and make appropriate linguistic corrections in a new language and dialect” (p. 225).

Given the changing demographics of the United States and the increasing multicultural and multilingual nature of today’s classrooms, there will be continued interest in the role that metacognition plays in bilingualism and in language learning. Moreover, given that some languages are more similar to each other than others, researchers will need to attend to whether increased metalinguistic knowledge and understanding depend on how similar languages are. As stated by Francis (1999), it is “reasonable to ask whether the particular language combination influences the degree of integration between languages in semantic representations” (p. 214).

**Integration of Metacognition Into Teacher Preparation**

Why should metacognition be an important part of teacher preparation programs? I have noticed the benefits of the development of expertise in my introductory educational psychology classes even if only in terms of being able to understand and use the term metacognition. I frequently ask my students to write a “one minute paper” at the end of a class session in response to two questions. The first is, “What in this course interests you the most?” The second is, “What in this course confuses you the most?” In the early part of the semester, metacognition is repeatedly mentioned as one of the most confusing topics. In particular, the students complain about the term itself, characterizing metacognition as an example of jargon created by educators to confuse those who are not indoctrinated into the educational endeavor. As the course continues, the students begin to realize, as happens with the development of expertise in any field, that terminology allows one to represent complex ideas with a single word. They discover its usefulness as they talk to each other in small groups,
participate in class discussions, and write papers. By the end of the semester, many students consider metacognition to be one of the most valuable parts of the course and communicate their desire to help students become more metacognitively aware (often in reaction to what they perceive as a dismal failure on the part of those who taught them).

It is encouraging that there is growing recognition that a central part of the teachers' role is to foster the development of metacognition in students and to apply metacognition to their own instruction. There is also a considerable challenge facing us: how to make sure that what researchers and theorists have learned about metacognition and its role in learning has an impact on standard classroom practice. Hartman (2001b) referred to the dual role of metacognition in teaching as teaching with metacognition (reflection on goals, student characteristics, content, etc.) and teaching for metacognition (how to activate and develop metacognition in students).

What does happen in classrooms? Can we observe teachers embracing this dual role? Artzt and Armour-Thomas (2001) examined the instructional practice of seven experienced and seven inexperienced teachers of high school mathematics. Throughout one semester, these researchers observed the teachers, looked at their lesson plans, and analyzed videotapes and audiotapes of their classrooms. They developed the Teacher Metacognitive Framework (TMF) to examine the mental activities of the teachers, particularly teachers' knowledge, beliefs, goals, planning, monitoring and regulating, assessing, and revising. Their analysis revealed three general categories: teachers who focused on student learning with understanding (a metacognitive orientation), teachers who focused on their own practices, and teachers who exhibited a mixture of the two foci of attention.

Zohar (1999) evaluated the effectiveness of a "Thinking in Science" course designed to increase in-service teachers' understanding of metacognition. Zohar assessed teachers' intuitive (preinstructional) knowledge of metacognition of thinking skills and then analyzed class discussions, lesson plans, and written reports from the teachers throughout the course. Teachers who had been teaching higher order thinking before taking the course were not explicitly aware that they had been teaching thinking skills and did not consciously plan for engagement in metacognitive activities with their students. The development of thinking skills in their students had not been an explicit goal of their instruction. Zohar (1999) found that participation in the course did encourage teachers consciously to design learning activities rich in higher order thinking goals and activities.

Instructional interventions have also been demonstrated to facilitate the development of metacognition in preservice teachers. Matanzo and Harris (1999) found that preservice reading methodology students had a limited knowledge of the role of metacognition in reading. After course instruction designed to develop more metacognitive awareness, the preservice teachers who became more metacognitive also fostered the development of metacognition in students with whom they interacted as indicated by classroom observations.

What would be our ultimate goal for teachers' understandings about metacognition? Borkowski and Mathukrishna (1992) argued that teachers must develop internal models of what it means to be reflective and strategic—essentially a good thinker. The hypothesis is that teachers who possess a "working model" of their students' metacognitive development are more likely to be teachers who focus on the development of metacognition. A working model is a schema for organizing knowledge—a framework. It can react to opportunities and challenges, thereby growing and developing. Teacher preparation can provide a broad framework and practical suggestions for the development of the mental model, but every mental model must be the result of an active personal construction. Each individual teacher must create his or her own model based on experiences.

In 1987 Jacobs and Paris noted that it would be more difficult to incorporate what we know about metacognition into classroom practice "now that the first glow of metacognition as a new approach to reading has faded" (p. 275). It may be even more difficult today. For the past six years the International Reading Association has asked 25 literacy leaders to indicate "What's hot, what's not" for reading research and practice for the coming year (Cassidy & Cassidy, 2001/2002). They were asked to rate a topic as "hot" or "not hot" and to indicate whether a given topic "should be hot" or "should be not hot." The list of topics was generated from professional journals, conference programs, newspaper and magazine articles, and more general educational publications. For 2002, metacognition was not even on the list to consider, and reading comprehension was rated by the literacy leaders as "not hot, but should be hot."

Any attempt to disseminate more completely what we know about metacognition into teacher preparation and, ultimately, into classrooms must be developed with an awareness of potential constraints due to the demands that such instruction would place on teachers and students. Sitko (1998) articulated the costs of metacognitive instruction from the teacher's perspective. It typically requires more class time and demands more of teachers in terms of content knowledge, task analysis, and planning time. Gourgey (2001) described student reactions as she introduced metacognitive instruction in college-level remedial classes. Baldy stated, the students
were not happy about metacognitive teaching. They were not used to being asked to be thoughtful and did not appreciate having to expend the extra effort to do so. Nevertheless, the research reviewed in this chapter provides a strong mandate for infusing practices that support metacognitive processes into classrooms. This is a goal worth pursuing.

REFERENCES


Duffy, G. G., & Roehler, L. R. (1989). Why strategy instruction is so difficult and what we need to do about it. In C. B. McCormick,
Metacognition and Learning

G. Miller, & M. Pressley (Eds.), Cognitive strategy research: From basic research to educational applications (pp. 133–154). New York: Springer-Verlag.


100 Metacognition and Learning

(Eds.), Promoting academic competence and literacy in schools: Cognitive research and instructional innovation (pp. 311-336). Orlando, FL: Academic Press.


Schraw, G., & Impara, J. C. (Eds.). (2000). Issues in the measurement of metacognition. Lincoln, NE: Buros Institute of Mental Measurements and Department of Educational Psychology, University of Nebraska-Lincoln.


