



Research in Practice

Series III: Non-Academic Readiness Factors

Paper No. 1

Metacognition: An Introduction

By Thomas G. Fetsco and Barbara A. Soby

What does it mean in today's world to be college and career ready? There is a growing consensus among college access professionals that college and career readiness involves more than academic preparation. To a large extent, students also need to be effective problem-solvers and thinkers, and as life-long learners, they need to learn how to learn. This is where the research on metacognition can be useful to college access professionals and their students.

Why is Metacognition Important to College and Career Readiness Professionals?

Research suggests that metacognition impacts achievement (Lucangeli & Cornoldi, 1997; Sperling, Ramsay, Richmond, & Klapp, 2012; Wang, Haertel, & Walberg, 1990; Winne & Nesbit, 2010). Students' metacognitive capabilities become particularly important when thinking and learning become problematic or challenging (Holton & Clarke, 2006). For example, consider the challenges Dianne is facing as a college freshman.

Dianne is finding her first year in college to be quite challenging. She is failing both her world history and introductory sociology class. The failing grades are a big surprise to her because she did so well in high school and she is using the same study approaches that worked for her in high school. She thinks part of the problem is that these teachers are asking all the wrong questions. She often cannot find in her notes the answers to the test questions she missed. She is also not doing very well in her English Composition class, even though she believes she is writing A-level papers. That teacher keeps writing back to



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Northern Arizona
University, supported by
the U.S. Department of
Education*

her that she needs to stay more focused on the goal of the writing, whatever that means. Also, in the feedback for the last paper, her teacher asked her to come see him. This hurts a little, because all her life she has been told how smart she is, and smart people shouldn't need to see the teacher for help.

In the collective experiences of your authors as college access professionals and parents, Dianne is like a number of other college freshmen who have difficulty managing the academic challenges of the freshman year. The depth and breadth of information and the accelerated rate at which it is presented in college all can pose new challenges. Also, the increased emphasis on self-evaluation and self-direction can be quite a change for some students. Although an understanding of metacognition is unlikely to help with all of the issues college freshmen encounter, it has tremendous potential to help with the types of academic challenges that Dianne is facing.

Metacognition: a Definition

John Flavell (1979, 1987) is typically credited with originating the term metacognition, and his simple three-word definition of metacognition as thinking about thinking is still commonly used today. To clarify this definition, however, it is common for metacognition theorists to identify components or subtypes of metacognition, and equally common for these theorists to disagree about what components should be included. For our purposes, we will use the three-component model presented in Figure 1.

*Metacognition
is thinking
about thinking.*

A Three Component Model of Metacognition

As can be seen in Figure 1, metacognition is comprised of three components - metacognitive knowledge, metacognitive regulation, and metacognitive beliefs¹.

Metacognitive knowledge is learners' awareness of their own learning and thought processes. It includes insights about themselves as learners and learners in general (**person knowledge**); understanding of the nature of learning and problem-solving tasks (**task knowledge**); and information about approaches/techniques to improve performance, and the conditions under which those approaches/techniques are likely to be most useful (**strategy knowledge**). In Dianne's case, she seems to be relying on strategy knowledge she developed in high school, but her strategies do not seem to be working. For example, either she is not putting key information in her notes, or she is not successfully coordinating

¹ It should be acknowledged that the inclusion of metacognitive beliefs as a third component is controversial (Desoete, Roeyers, and Buysse, 2001).

textbook information with her notes. It could also be argued that her task knowledge about writing is not well-matched to how her English teacher defines the task of writing.

Metacognitive Regulation is learners' ability to control their own learning and cognitive processes. Metacognitive regulation involves employing skills that help learners enhance their learning and problem-solving, including the following: planning an overall approach to a task; monitoring/evaluating performance; correcting areas of concern; and selecting appropriate strategies for a particular task. Looking back on Dianne's situation again, her self-evaluation of her writing is not well-matched to her teacher's assessment. Interestingly, she does not want to seek out help from the teacher, which might help her correct the areas of concern her teacher has identified.

Metacognitive Beliefs are concepts learners have about their learning and cognition. In the college and career readiness context, achievement-related beliefs such as self-efficacy, achievement attributions, and college-going identity are particularly relevant. For example, Dianne seems to be attributing her lack of success to her teachers (e.g. they are not asking the right questions). As can be seen in Figure 1, although there are a variety of achievement-related beliefs, they tend to produce a common set of implications for education.

The relationship among the three components of metacognition is reciprocal, as indicated by the two-way arrows in the figure. That is, learners' motivational beliefs clearly affect their willingness to engage in metacognitive regulation, and the outcomes of their metacognitive regulation activities can affect their motivational beliefs. For example, Dianne seems to believe that smart people do not seek help. Her decision not to seek help is likely to lead to more non-successes, which may eventually cause her to lessen her confidence.

What are the Pedagogical Implications of Metacognition?

Metacognition is "not easily characterized nor easily stimulated in students" (Hacker & Dunlosky, 2003). Note for example Dianne's resistance to changing what she is doing. Implementing metacognition in classrooms requires more than the application of a finite number of teaching techniques. It is more likely that implementation will be successful within the context of what might be called a "culture of metacognition" (Darling-Hammond, et al. 2003, p. 162). A culture of metacognition has the attributes listed in Table 1.

A culture of metacognition engages students in appropriately challenging tasks.

Figure 1. A Three Component Model of Metacognition

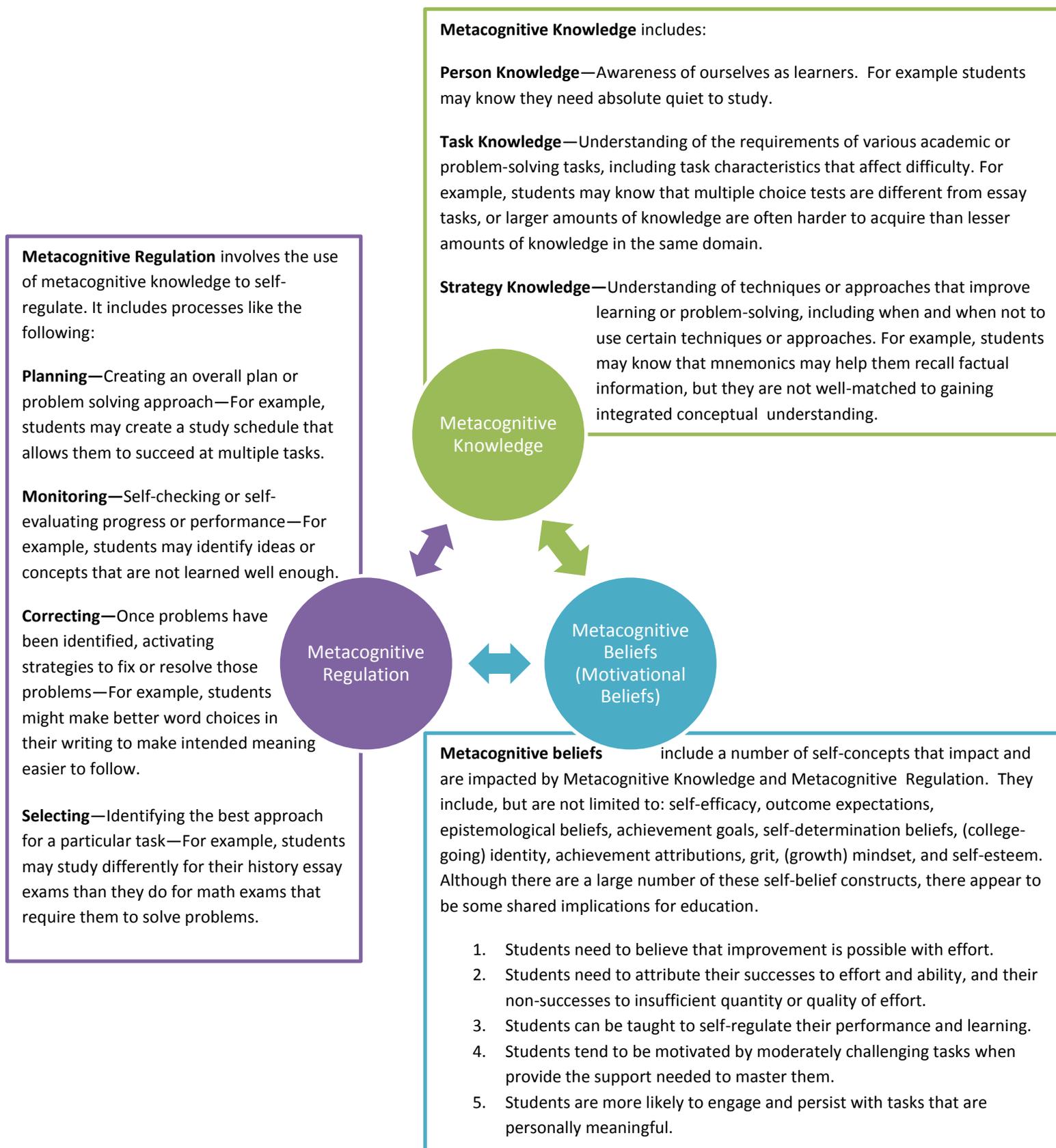


Table 1. Attributes of a Culture of Metacognition

Attribute	Why it's important
1 Students are engaged in meaningful and non-trivial learning experiences.	<i>Students are unlikely to see the need to learn how to think if the classroom environment does not require them to think (Beyer, 1998).</i>
2 Learners need to learn how to self-reflect effectively about efforts toward reaching their goals (Pressley & Ghatala, 1990).	<i>Initially, learners' self-reflections can be flawed or inaccurate. (Garner & Alexander, 1989, Dunlosky & Rawson, 2012). Accurate self-reflections provide teachers and students alike with useful information about students' learning processes.</i>
3 Teachers clearly communicate to students the purposes of learning activities and the criteria for successfully completing those activities.	<i>In order to plan appropriate strategies for success and to be able to monitor their progress effectively, students need to know what the goals are.</i>
4 Teachers provide opportunities for meaningful feedback through abundant and well-designed formative assessment processes that provide opportunities for self-reflection.	<i>Assessments and the accompanying feedback can provide important data for learning how to learn.</i>
5 Teachers model metacognitive regulation by "teaching with and for" metacognition (Rahman, Jumani, Satti, & Malik, 2010). Teachers who teach <u>with</u> metacognition model strategic thinking by discussing with students the decision-making that goes into their teaching. When teachers teach <u>for</u> metacognition, they talk aloud about strategies students should employ in completing an assignment, solving a problem, or approaching a task, as they demonstrate them.	<i>Students are exposed to the strategic thinking of respected models.</i>
6 Improvement and the processes that lead to improvement are stressed; failure is treated as a learning opportunity. Students are encouraged to revisit and revise their work, and there are opportunities for students to discuss how to improve learning with other students.	<i>Helps students develop a belief in their ability to succeed, and to persist through difficulty.</i>
7 Teachers explicitly facilitate students' understanding of how to transfer strategies to new and different situations.	<i>Considerable research warns against the assumption that learners will spontaneously transfer learned strategies. Helps students develop flexible strategic knowledge.</i>

Where to Next?

In this paper, we provided an introduction and description of what metacognition is (Series III, No. 1). In the next paper, we provide suggestions for fostering metacognitive development in students (Series III, No. 2), and in the third paper we take a deeper look into the motivational concept of self-efficacy (Series III, No. 3).

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The *Research in Practice* Paper Series is a project of the Initiative on the Study of College and Career Readiness (ISCCR) at Northern Arizona University. The goal in publishing it is to foster college and career readiness in middle and high school students by sharing information and promoting evidence-based practices in education.