Metacognition: Thinking about Thinking and what it means for Learners

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Introduction

Albert Einstein once said, "Education is what remains after one has forgotten what one has learned in school" ("Albert Einstein Quotes," n.d.). What if we could increase student achievement, and memory retention, in school? Metacognition may provide an avenue for realizing those student-learning gains. Put simply, metacognition is recognizing and regulating ones' thinking (Hughes, 2017). While seemingly complex and simple all at the same time, metacognition has been shown to be beneficial to students in the learning process (Pate & Miller, 2011; Wang et al., 1990). It has even been correlated with life satisfaction (Cikrikci & Odaci, 2016)!

What is Metacognition?

Metacognition was defined by Reeve and Brown (1985) as "individuals' ability to understand and manipulate their own cognitive processes" (p. 343). Despite disparate conceptualizations of metacognition in educational psychology research over the past forty years (Young, 2010), researchers generally view metacognition as having two main components: a knowledge component and a regulation component (Jacobs & Paris, 1987; Schraw, 1998). Metacognitive knowledge consists of three types of knowledge: declarative, procedural, and conditional (Jacobs & Paris, 1987), while metacognitive regulation is regulatory activities such as planning, monitoring, evaluating, and revising (Brown et al. 1983). In a 2014 study of online learning environments, An and Cao postulated a model of metacognition that encapsulated both frameworks developed by Flavell and Brown et al. An adaptation of that model revised to fit the framework of Jacobs and Paris (1987) is shown in Figure 1:

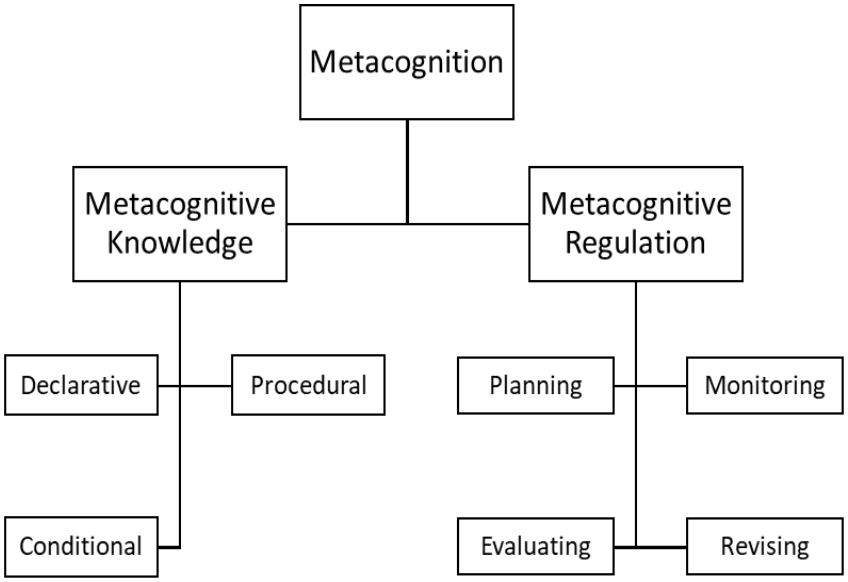

Figure 1. Model of Metacognition (An & Cao, 2014) adapted with Jacobs and Paris' (1987) Metacognitive Knowledge elements

How can it Impact Student Success?

Metacognition is a broad term that encompasses both regulatory executive processes – self-regulation being one – and knowledge of one's own thinking abilities. Research has shown that "teaching, prompting, and facilitating learners' use of metacognitive skills results in improved learning performance" (Schwartz, Scott, & Holzberger, 2013, p. 91). These instructional gains are on top of – as opposed to being in sequence with – intellectual ability (Veenman, Van Hout-Wolters, & Afflerbach, 2006). Additionally, one subcomponent of metacognition (self-regulation) was found to be a better predictor of standardized test scores than socioeconomic status (Zimmerman & Martinez-Pons, 1986). Taken as a whole, enhancing metacognitive thinking offers the opportunity to make real impact on student achievement academically.

Metacognition, Teachers, and Student Thinking

While we know metacognition is beneficial, we also know teachers may not be familiar with it (Hughes, 2017; McKendree & Washburn, 2017). Unfamiliarity by teachers may present problems as students progress through the education system. The National Research Council (2000) placed importance on teachers, "because metacognition often takes the form of an internal dialogue, many students may be unaware of its importance unless the processes are explicitly emphasized by teachers" (p. 21). In addition to the necessity of explicit emphasis by teachers, the internal nature of metacognition also contributes to the complexity of teachers being able to recognize, and facilitate, metacognition. Although students may gain metacognitive skills from other places, their teachers represent a very real opportunity to enhance and promote metacognitive thinking.

A key sticking point with metacognition and educators can be its similarities with deeper levels of thinking (McKendree, 2019). Instead of being conceptualized as an executive process that stands out from cognitive levels of thought (i.e., remember, understand, apply, analyze, evaluate, create), it can easily be confused with challenging students to think deeply about a subject. While 'deeper' thinking is – and should be – the target of educators, metacognition represents a cognitive task that transcends traditional levels of thinking. It can be a contributor to success or failure for a student completing an 'analyze' task just the same as a student completing a 'remember' task.

What we can do with Metacognition and Students

During this interactive session, come engage with colleagues in a discussion of how we can incorporate metacognition strategies into our teaching. Together, we will discuss how we can increase the prevalence of metacognitive language within our classes, and identify specific strategies for promoting and increasing students' metacognitive thinking. Ideas discussed include increasing student metacognitive knowledge with the use of strategy evaluation matrices, a tracking system that allows students to accrue learning strategies, and increasing metacognitive regulation with regulatory checklists. We will also focus on how we can increase our own metacognitive states as practitioners with some targeted applications.

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