Center on Innovations in Learning

Wise Ways®

Core Function: Personalized Learning: Metacognitive Competency

Effective Practice: Teach and model metacognitive processes and strategies to enhance students' self-management of learning

Indicator: All teachers and teacher teams plan instruction based on the aligned and expanded curriculum that includes objectives for student management of their learning. (D3)

Explanation: Personal learning models emphasize a number of instructional strategies to enhance students' metacognitive competency and encourage management of their own learning. Explicit strategy instruction that includes teacher modeling, scaffolding of the strategy to students through plenty of guided practice, and self-assessment of student learning has been shown to positively impact student learning. Effective strategies include think-aloud, goal setting, and self-checking for learning. Teachers may need discipline-specific professional development on how to promote metacognitive competency within their teaching contexts.

Questions: What are the benefits of building students' metacognitive competency? What teaching strategies benefit students' metacognitive competency and encourage them to manage their own learning? How can teachers plan instruction to maximize student metacognitive competency?

What Are the Benefits of Building Students' Metacognitive Competency?

Learner-centered, or personalized learning refers to "a teacher's relationships with students and their families and the use of multiple instructional modes to scaffold each student's learning and enhance the student's personal competencies" (Twyman & Redding, 2015, p. 3). The student is actively involved with the teacher in co-constructing their individualized learning pathway, and often through technology the location, time and pace of learning may vary from student to student (Redding, in press). Metacognitive competency, one of four personal competencies within recent personalized learning frameworks[1] becomes critical for student success, particularly within personalized learning pedagogies, as students are responsible to some degree for managing their own learning. Metacognition refers to how students learn, and self-regulate learning and use of learning strategies (Redding, in press). Research has provided extensive support for explicitly teaching self-regulated learning strategies to students, and meta-analyses have shown consistently positive effects on student performance generally, and in specific domains such as reading, writing, and mathematics (e.g., Hattie, Biggs & Purdie, 1996; Dignath & Büttner, 2008). In a recent comprehensive meta-analysis including 58 studies addressing 95 strategy instruction interventions, researchers found that:

> Strategy instruction that included the combination of 'general metacognitive knowledge', the metacognitive strategy 'planning and prediction' and the motivational strategy 'task value' enhanced student performance the most effectively. Therefore, teaching students skills such as determining when, why and how to use learning strategies, how to plan a learning task and establish goals for learning, and explaining the relevance and importance of a task (so that they see the importance of what they are doing) are important aspects of self-regulated learning interventions. Especially the inclusion of task value in the strategy instruction had a large effect on student performance. (deBoer, Donker-Bergstra, & Kostons, 2013, p. 59-60)

[1] Other personal competencies are Cognitive, Motivational, and Social/Emotional. For a complete description of a personalized learning framework see Redding, in press: http://www.centeril.org/2016handbook/resources/Redding_chapter_web.pdf)

The researchers also found evidence that these strategy instructional interventions had a sustained and long-term positive effect on student performance. Metacognitive strategy instruction is particularly imperative given many states' and districts' adoption of Common Core Standards, which require students to be able to use metacognitive learning strategies extensively in order to engage in higher-order processes such as researching and synthesizing information, and critically reading and evaluating texts (Conley, 2014).

What Teaching Strategies Benefit Students' Metacognitive Competency and Ability to Manage Their Own Learning?

Research shows that explicit metacognitive strategy instruction is necessary to produce significant achievement gains (Kistner, Rakoczy, Otto, Dignath-van Ewijk, Büttner, & Klieme, 2010) and foster student regulation of their own learning. Characteristics of explicit instruction include modeling use of the strategy and explaining its benefits, direct instruction, and providing plenty of opportunities for students to use the strategy in guided and independent practice settings by scaffolding instruction (Allington, 2002; Ellis, Denton, & Bond, 2014). Goal-setting for learning tasks is an effective metacognitive planning strategy; for example, teacher modeling of goal setting followed by having students analyze past performance to set new performance goals is positively associated with achievement (Marzano, 2009). An often used method of modeling also involves thinking aloud, as teachers verbalize what they are doing while using a strategy and pose questions or identify resources as they model. Teachers can also model "I Learned" statements, which are written or spoken summaries of what has been learned. Teacher modeling and subsequent student use of think aloud and "I Learned" statements have shown positive benefits to achievement in recent research (Bond & Ellis, 2013). Teachers can also model diagramming (e.g., concept maps, t-charts, flow charts, etc.) as a learning tool to demonstrate understanding and scaffold the strategy to students with plenty of guided practice and opportunity for independent application; visual learning methods have been shown to significantly impact achievement (Ellis, et al., 2014). Other research-based practices include student monitoring of their learning through answer checking and completing checklists to prompt specific behaviors necessary to complete tasks (Ellis, et al., 2014).

How Can Teachers Plan Instruction to Maximize Student Metacognitive Competency?

Twyman and Redding (2015) and others (Wolf & Davis Poon, 2015) advocate teachers intentionally building metacognitive competencies into their teaching and lesson planning; for example, documenting explicitly how a lesson plan component promotes students' self-regulatory abilities, goal setting, and tracking of mastery. However, metacognitive instruction is not commonly observed and teachers often have limited knowledge about metacognition and how it can be enhanced (Wilson & Conyers, 2014). Professional development that provides teachers with this knowledge and how they can teach and reinforce metacognitive learning behaviors in their students has been successfully used within several areas, including science inquiry programs (Seraphin, Philippoff, Kaupp, & Vallin, 2012), formative assessment within middle school math classrooms (Dempsey, Beesley, Fazendeiro Clark, & Tweed, in press) and elementary students' formative self-assessments of their learning using rubrics (Zubrzycki, 2015). Deeper learning within domains may require metacognitive instruction embedded within content to help students "think like a historian or an engineer" for example (Muijs, Kyriakides, van der Werf, Creemers, Timperley & Earl, 2014; Graesser, 2015), suggesting that this instruction should be strategically incorporated into teacher planning within professional learning communities.

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