Research in Practice

Series III: Non-Academic Readiness Factors
Paper *No. 2*

A Culture of Metacognition

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The first paper in this series briefly introduced the idea of a culture of metacognition. This paper provides more specific suggestions for creating a culture of metacognition. These suggestions focus on three attributes of a culture of metacognition: student self-reflection, students' strategic learning, and students' motivational beliefs. By creating a learning environment that engages students in metacognitive activities, students' metacognitive skills will develop, and ultimately students will be more successful. The strategies described in this paper are summarized in the end, in Table 1.

Teach Students to Self-Reflect About Their Learning

In a culture of metacognition, students are provided with multiple opportunities to reflect about their learning, and to share those self-reflections with teachers or other students. According to Darling-Hammond, et al. (2003), these self-reflections not only help students become more aware of themselves as learners, but they also provide important information for instruction. However, research tends to demonstrate that students do not learn important self-regulation skills simply by engaging in practice with self-regulated learning, they need additional training or instructional support to acquire those skills (Kostons, Van Gog, & Paas, 2012). Formative assessment processes provide multiple opportunities for additional training or support for students' self-reflection

Use formative assessments to enhance students' metacognitive reflection. The formative assessment processes that teachers use to monitor the effects of their teaching and to provide feedback to students about their learning have great potential for developing

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students' metacognitive capabilities (Hudesman, et al. 2013). Unfortunately, very often these assessment processes fail to provide useful information to students and teachers about teaching and learning (Hattie & Timperley, 2007). Hattie and Timperley (p. 102) go on to note that effective assessments should help students gain knowledge about what they know and do not know, identify strategies and directions to know how to improve, and help students understand the goals of learning. The following suggestions can help educators enhance students' metacognitive knowledge and skills through formative assessment.

1. Make sure that assessment directions, purposes, and success criteria are made clear to students. Students need this information to guide their choices of strategies and to monitor their success.

Clear directions and success criteria help learners match strategies to tasks.

2. Integrate self-monitoring activities into assessments. For example have students rate how confident they are that they answered items on a test correctly, or have students include a self-completed rubric along with assignments. Make sure there is time for students to reflect on any differences between their ratings and their actual performance.

3. Provide cues/prompts in formative assessments that guide students toward more successful strategies (e.g. "Remember that it helps on these types of questions to make a diagram or picture.")

4. Provide opportunities for peer support in terms of: a) planning an approach to a problem, assignment or project; b) feedback about success; and c) suggestions for revision or improvement. Make sure these interactions are scaffolded appropriately because students typically need guidance on how to be of help to other students.

5. Provide modeling that guides students toward success. For example, prior to a test or an assignment, facilitate a class discussion about what students have done in the past to be successful with similar tasks, and/or model how to approach particular tasks. Or, teachers can debrief with students after a formative assessment in terms of what they did to succeed or how they might handle areas of difficulty in the future.

Teachers and students can be powerful models of strategic behavior.

Teach Learners to be Strategic

Pressley and his colleagues define learning strategies as "processes (or sequences of processes) that, when matched to the requirements of tasks, facilitate performance" (Pressley, Goodchild, Fleet, and Zajchowski, 1989, p. 303). Note-taking, elaboration, concept mapping, text highlighting, and PQ4R are all examples of learning strategies. To be strategic learners, students need a variety of learning strategies and an understanding of how, when,

and why to use those strategies (Donker, de Boer, Kostons, van Ewijk, & van der Werf, 2014; Wood, Woloshyn, & Willoughby, 1995).

Some learning strategies need to be taught explicitly. Although some strategies such as rote rehearsal tend to develop naturally, other strategies such as text summarization typically need to be taught to students. Explicit strategy instruction usually involves the following steps (Fetsco & McClure, 2005, Pressley, et al., 1989; Deshler, Ellis, & Lenz, 1996).

1. Teachers describe a strategy and model it by talking aloud as they use the strategy.

2. Teachers explain why students should learn the strategy. What are the potential benefits?

3. Teachers inform students about when and why to use the strategy. This knowledge is particularly important for helping students transfer what they have learned to other relevant contexts.

4. Students are provided with guided practice and coaching as they apply the strategy.

5. Students are asked to reflect on the use of the strategy, which could involve assessing the usefulness of the strategy and how it might be modified to make it more effective.

6. Students are provided with additional opportunities to apply the strategy with different tasks or in different contexts to facilitate transfer.

Transfer of learning is facilitated by practice with varied tasks.

In addition, educators might want to consider the following in their explicit instruction of strategies:

- Ask successful students what they did to succeed at a task. Students may offer a unique perspective on strategic behavior, and could serve as models of those strategies.

Students may have a unique perspective on strategic behavior.

- Break complicated strategies into steps or parts, or provide concrete cues in the beginning stages of learning such as a reference card with the strategy steps listed (Fetsco & McClure, 2008).

- Have students practice new strategies on previously learned content or familiar problems so that students can focus more on the strategy than the unfamiliarity of the content or problems. An added benefit of this structure is that it provides spaced practice for the content, which is likely to make it more memorable (Dunn, Saville, Baker, & Marek, 2013).

- Teachers in different content areas could teach similar strategies in their courses.

It is important to note that explicit strategy instruction can occur through stand-alone approaches or it can be embedded in classroom instruction (Rhoder, 2002). Stand-alone

approaches deliver strategy instruction through separate curricula or courses. Embedded strategy instruction occurs within the content of the existing curricula. For example, strategies for reading a textbook would be taught as students read the assigned text for the class. Whatever approach is selected, focus should be on connecting strategies to students' classroom tasks. This is likely to be easier with embedded instruction, but with embedded instruction, there is the potential risk that strategies become exclusively associated with the classroom tasks used to teach the strategy. To encourage transfer, embedded strategies need to be embedded in different curricular areas for different purposes.

Promote Optimistic Achievement-Related Beliefs

Motivated students are more likely to embrace academic challenges, exert extended or intense effort, employ active problem-solving strategies, and persist when things do not go well (Elliot & Dweck, 1988). A culture of metacognition, therefore, should be designed to promote student motivation.

Students tend to be motivated by moderately challenging tasks that provide the support needed to master them. Succeeding at moderately challenging tasks has multiple possible motivational benefits. First, success at these tasks can positively affect students' beliefs about what they can accomplish (self-efficacy). Second, these types of experiences can help students develop what Carol Dweck calls a growth mindset (Dweck, 2007). Learners with a growth mindset believe that ability can improve through effort. Success at increasingly challenging tasks is a signal to students that their skill level or competence is increasing (Schunk, Meece, & Pintrich, 2014).

Success with moderately challenging tasks increases self-efficacy.

Providing appropriate challenges for students at different levels of academic preparation can be difficult. The same task could be appropriately challenging for some students, but too hard or too easy for others. Consequently, providing an appropriately challenging learning task for all students is likely to require differentiating instruction at some point. Although it is beyond the scope of this paper to fully discuss differentiated instruction, here are some basic suggestions.

- Match educational expectations to students' skill level. This means that teachers need trustworthy data on students' skill development. Activities such as pre-testing or benchmarking students' progress can provide these data. The advice provided earlier in this paper on formative assessments may be useful to consider here.

- Before engaging students in learning new content, make sure prerequisite knowledge, skills, and vocabulary have been identified, and develop an approach to make that knowledge available to students who lack it.

- From a metacognition perspective, helping less-prepared students develop appropriate learning strategies could allow them to succeed at tasks that are moderately challenging for more prepared students, but currently too difficult for them.

Effective use of strategies can help learners succeed at challenging tasks.

Students need to believe that improvement is possible with effort. This recommendation derives from a number of motivational theories and constructs. From a social cognitive perspective, Bandura (1997) suggested that it is important for people to develop a sense of personal agency, which means that they control important events in their lives. Dweck's (2007) notion of a growth mindset would suggest that learners are more likely to prefer moderate challenges, and to persist at them if they believe that their abilities can be improved. There are a number of approaches educators can use to help students believe that improvement is possible with effort.

- Provide students opportunities to reflect on feedback and to revise and resubmit their work.

- Provide specific feedback that links effort to improvement. For example, "This paper is much improved over earlier papers. You are doing a great job of using the feedback your peers have given you about organizing your thoughts better."

- Help students set improvement goals for themselves and opportunities to self-monitor their improvement.

Encourage and Reinforce Use of Metacognitive Pedagogy in the Classroom

Principals and Instructional Coaches could develop classroom observation rubrics based on the instructional strategies described here, and summarized in the table below, to ensure the behaviors and activities outlined in this brief, necessary for creating a culture of metacognition, are taken into account in teacher evaluations and feedback.

Where to Next?

The third paper in this series delves more deeply into motivational concept of self-efficacy. It is an achievement-related belief that has probably been researched most extensively.

Table 1. Summary of Classroom Strategies to Foster Metacognitive Development

Teach Students to Self-Reflect
1. Make sure that assessment directions, purposes, and success criteria are made clear to students.
2. Integrate self-monitoring activities into assessments.
3. Provide cues/prompts in formative assessments that guide students toward more successful strategies.
4. Provide opportunities for peer support.
5. Model how to approach particular tasks/assignments/problems.
6. Facilitate class discussion about what students have done in the past to be successful with similar tasks.
7. Debrief with students after a formative assessment about what worked and what didn't.

Teach Learners to be Strategic
8. Describe a strategy and model it by talking aloud as while demonstrating the strategy.
9. Explain why students should learn a strategy, what the potential benefits are.
10. Inform students about when and why to use the strategy.
11. Provided guided practice and coaching as students apply a strategy.
12. Ask students to reflect on the use of the strategy, assessing its usefulness and how it might be modified to be more effective.
13. Provide students opportunities to apply a new strategy with different tasks or in different contexts.
14. Ask successful students what they did to succeed at a task.
15. Break complicated strategies into steps or parts, or provide concrete cues.
16. Have students practice new strategies on previously learned content or familiar problems.
17. Teachers in different content areas teach similar strategies.

Promote Optimistic Achievement-Related Beliefs
18. Match educational expectations to students' skill level by using trustworthy data on students' skill development.
19. Ensure prerequisite knowledge, skills, and vocabulary have been identified and developed before teaching students new content.
20. Provide students opportunities to reflect on feedback and to revise and resubmit their work.
21. Provide specific feedback that links improvement to effort, not innate ability.
22. Help students set improvement goals for themselves and opportunities to self-monitor their improvement.

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