How Metacognitive Strategies Can Maximize Learning

A summary of best practices by Stronge & Associates Educational Consulting, LLC

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Teaching students traditional, discrete sets of content and skills is essential. However, that is not enough to prepare students for the accelerating changes they will encounter in the future society and workplace. Students need the metacognitive capacity to have the awareness and understanding of their own learning processes, so they continuously guide their learning.

The Greek prefix *meta-* means beyond and about; therefore metacognition means cognition about cognition and knowing about knowing. Gregory Thomas (2003) defines metacognition as "an individual's knowledge, awareness and control of his/her thinking and learning strategies" (175).

All learners have general knowledge or awareness about their cognitive and thinking processes. They may know they need to use specific strategies when they generate hypotheses, observe, make inferences, analyze and synthesize information, develop thesis statements and arguments, or draw conclusions. They may even manipulate and adjust these strategies unconsciously. However, this awareness and control usually are not functioning optimally and need teachers' support or intervention in order to improve.

When metacognition is overtly and consciously developed, taught, and modeled, students can get a deeper, clearer mastery of metacognitive skills (Askell-Williams, Lawson, & Skrzypiec 2012; Zepeda et al. 2019). On the teachers' part, in order to build student metacognitive skills, the teachers can provide explicit instruction about why, when, and how to use specific strategies.

By providing supports for metacognition, students will better understand the rationale, context, and effective procedures for the strategies, and they will know the criteria for evaluating their use, therefore being able to self-monitor.

Teaching metacognitive strategies has a positive impact on student learning (de Boer et al. 2018). One study found explicit teaching of metacognitive reading strategies can improve students' reading comprehension and strategy use (Aghaie & Zhang 2012). Students who received the explicit teaching demonstrated more autonomous reading behaviors. For instance, they were better at deciding in advance specific aspects of information to look for and focusing on that information when reading. They were also better at examining the relationships between main ideas and testing if their predictions were correct.

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When examining Grade 4 scientific text reading, another study found metacognitive instruction improved student performance in all measured outcomes: domain-specific scientific knowledge, general scientific literacy, and metacognitive awareness (Michalsky, Mevarech, & Haibi 2009). In this study, students were explicitly taught to ask self-addressed metacognitive questions, such as:

- "What do I already know about the phenomenon?"
- "What are the similarities and differences between the problems at hand and the problems I have encountered in the past?"
- "Does the solution make sense?"
- "How can I design the experiment in another way?"

Research has consistently found that explicit teacher support and facilitation can improve students' metacognitive skills across almost all subject areas—reading (e.g., Dabarera, Renandya, & Zhang 2014), science (e.g., Leopold & Leutner 2015), and mathematics (e.g., Lee, Yeo, & Hong 2014). Research even suggests that students' metacognition can be more effective than their cognitive aptitude in predicting learning performance (van Luit & Kroesbergen 2006). In addition, explicit teaching of metacognition can improve learning of both low-achieving and high-achieving students, but the improvement for low-achieving students is even more prominent.

Furthermore, both low-achieving and high-achieving students can not only preserve their metacognitive learning immediately after the instruction, but also transfer it to new tasks three months later.

Therefore, instruction on student metacognition does not only yield immediate results, but also reaps dividends in long term (de Boer et al. 2018; Zohar & Peled 2008). ●

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