Metacognition

Jason has been assigned a science project, but he does not seem to have any idea how to start. He sits and stares out the window for a while and then raises his hand for the teacher. "I don't understand," he says.

"Well," the teacher says, "let's think about some things you might do to start."

"I could make a list of the things I have to do."

"What else could you do?"

"I could think about what I did on my last project."

"Good idea."

"Last time, I went to the library and looked on the computer. I wasted a lot of time without finding anything."

"What could you do different this time?"

"Maybe I could ask Heather to help me with search words. She's really good at that."

"That sounds like the beginning of a good plan."

Jason is intelligent and interested in science, but he is lacking in abilities that help him do complex projects. In her dialogue with him, the teacher is helping him think metacognitively so that he can develop an awareness of his thinking processes, plan strategies for completing the project, and monitor the success of those strategies.

Metacognition, or "thinking about thinking," refers to the mental processes that control and regulate how people think. Metacognition is especially important in project work, because students must make decisions about what strategies to use and how to use them. Marzano's (1998) research of 4,000 instructional interventions found that those that were most effective in improving student learning were those that focused on how students think about their thinking processes and on how students feel about themselves as learners.

Components of Metacognition

The most basic component of metacognition is awareness of thinking processes. This awareness includes both the ways that students usually approach a task and alternative ways that they might approach it. Good learners are aware of how they think and can make smart choices about effective strategies.

The planning component of metacognition is responsible for "identifying or activating the specific skills, tactics, and processes that will be used in accomplishing the goal" (Marzano, 1998, p. 60). A student at this stage has an inner dialogue about what she could do and what would be most effective under the circumstances. If the task is simple, the person may not even be aware of the choices she is making. With a complex task, however, the metacognitive process is more explicit as the student mulls over different options in her mind.

The final component of metacognition is monitoring. This function checks on the effectiveness of the plan and the strategies being used. For example, a sophomore biology student has decided to make a map on the computer to review a chapter for a test. After a few minutes, he realizes that he's spending more time figuring out the software than thinking about the content and decides to draw the map on paper. A fifth grader who is compiling data about the temperature and humidity begins to add long lists of numbers and then realizes the work would be much faster and more accurate if she used a spreadsheet program. Continuous monitoring of thinking processes and making necessary changes is a critical component of metacognition.

Reference

Marzano, R. J. (1998). *A theory-based meta-analysis of research on instruction*. Aurora, CO: McREL. Retrieved from www.mcrel.org/PDF/Instruction/5982RR_InstructionMeta_Analysis.pdf