

Getting Faculty to Promote Metacognition in Students

Emily Egan, Geoffrey Sauk, Tony Buzzza, Peter Park, and Kosta Gulin

What is Metacognition?

Metacognition in education refers to the awareness of one's own level of understanding of a concept. To be able to effectively learn a concept, students need to see how well they actually understand the material.

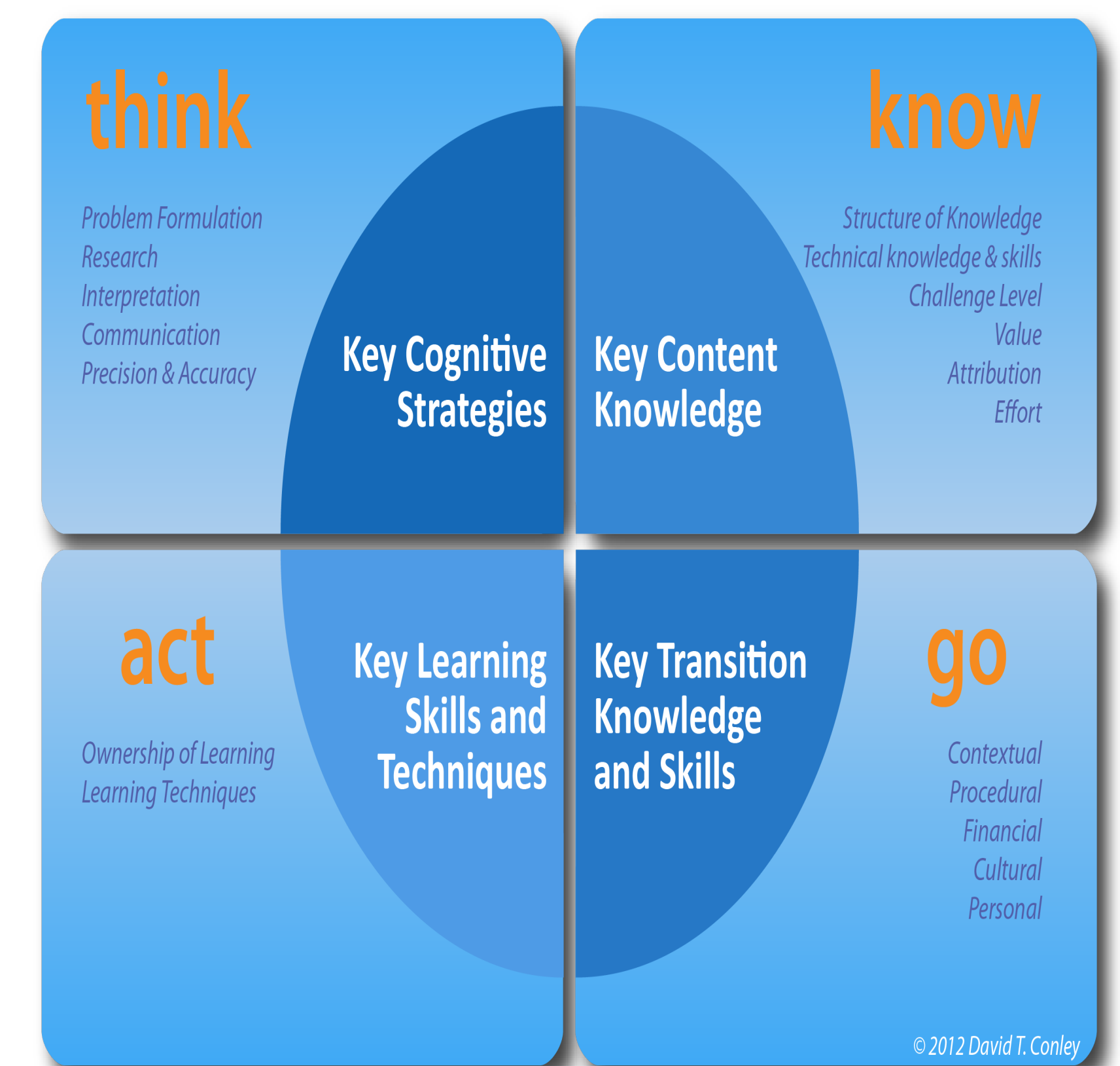
This can be a major challenge to students, as they tend to have trouble evaluating their own proficiency in a subject, often overestimating their ability. This overconfidence can lead to a lack of preparation and overall underperformance in a course.

Thus correctly evaluating one's comprehension of a subject is a crucial step in the learning process. In fact, "Studies have shown that, to achieve a conceptual understanding of complex science topics, learners need to use self-regulated learning (SRL)... metacognition is a key aspect of SRL, particularly metacognitive monitoring and control" (Tuysuzoglu & Greene).

In order to achieve metacognition students can perform various self tests known as metacognitive regulation. These are usually tasks that test a student on knowledge they've recently learned in order to assess how well they understood the material. Through these methods their knowledge is challenged and misconceptions start to emerge, showing the students what it is that they really need to review.

Student Comparison With Metacognition

Students are not always aware of their understanding of material in a class and don't even know they have a misconception of their own abilities. A professor at Beloit College would give students options on an exam to select 3 questions not to be graded. They still had to answer the questions and in addition select reasons why they couldn't answer it, such as "didn't study" "didn't know the answer" or "could narrow down to 2 but not further". Her idea was to make students think just for a minute about why they don't know the answers. Some students are asked after they receive their grades to answer similar questions. Most of the times, students are able to see the faults in their own perception of themselves and take action to improve themselves without explicitly being told about metacognition. Her program in just 2 years generated some signs of improvement among students.

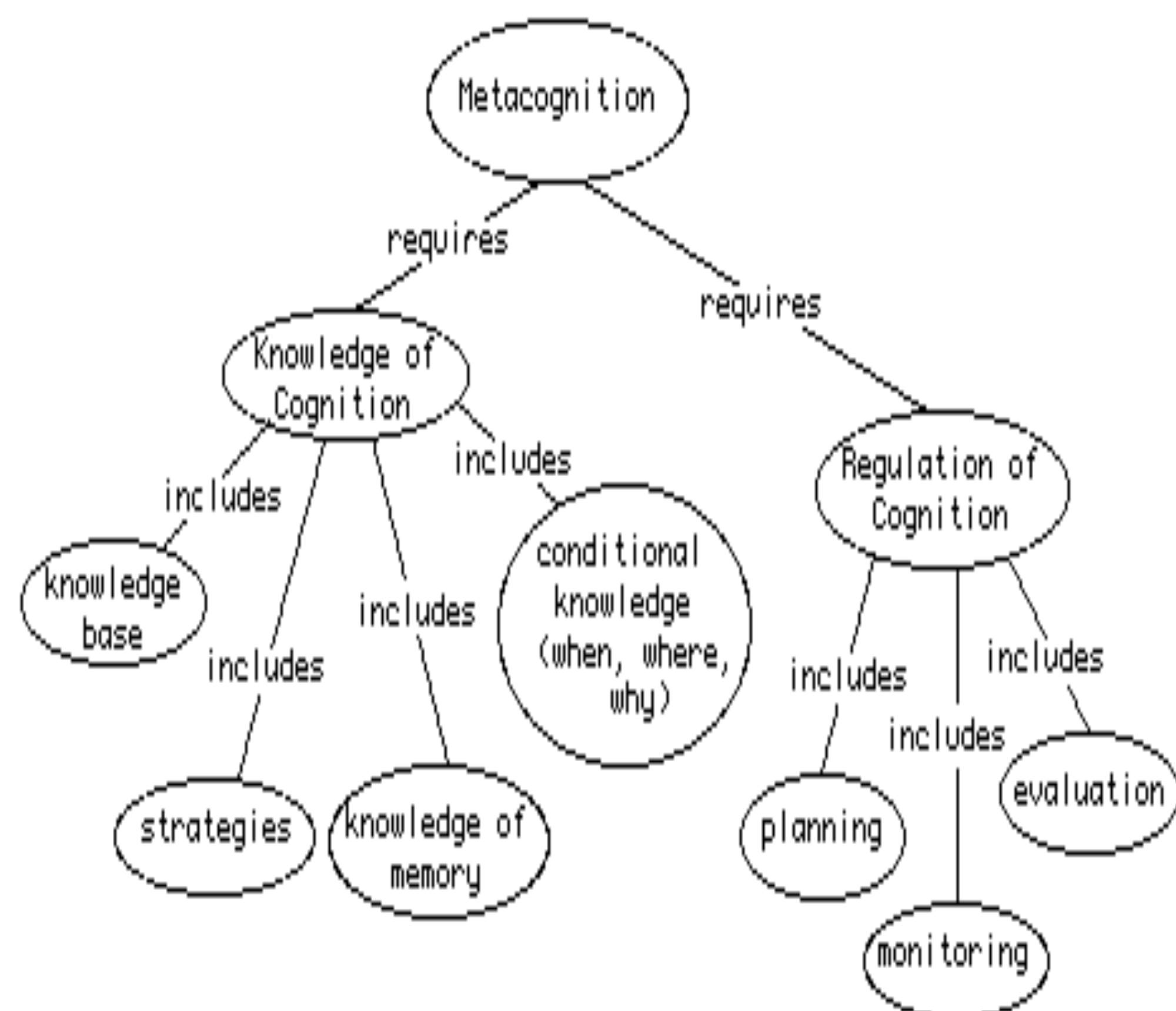


A Study in Metacognition

In 2007, a study was held in a "large public University in the Southeast". The study included 170 students (103 females, 67 males, average age 19.92, SD =2.14yrs), but focused exclusively on the 81 students (49 female, 32 males, average age 19.7, SD=1.33yrs) that displayed negative "judgment of learning" (JOL). JOL was defined in this study as "metacognitive monitoring", or how each individual student perceived his or her understanding of the material.

The core of this study consisted of a pretest, posttest, and a learning phase in between. During the learning phase, the participants were taught how to think aloud and were encouraged to do so throughout the whole learning process. Students that displayed negative JOL were the students that expressed doubt in understanding the material at certain points during the study. On average, students displayed two to three instances of negative JOL; and also on average, students would adapt and change their method of learning more often than staying static and not changing their methods.

Between the pre and posttests, there resulted in an increase in the median score of 2 points, but individual students that displayed the most willingness to adapt their learning strategies after instances of negative JOL displayed the most increase in scores between the pre and posttest. Thus the importance of metacognition is clearly shown in the results here. It can be garnered that not only were the students' recognition of their poor understanding of the material (negative JOL) important in bettering their results, but the act of changing study methods in response to not understanding the material seemed to have a possibly equal impact on the end results of the tests.



Suggestions

- At the beginning of a chapter, give an example of a real life situation that can be solved with the new information they are going to learn in the new chapter and with information that was already taught.
- At the beginning of lecture, tell students to think about what they think the key points of the lecture is while they are listening and taking notes. At the end of the lecture, ask the students what they thought the main points of the lecture was. Then afterwards tell them what the main points actually were.
- At the beginning of lecture, ask students a question that is a common misconception about the topic that is going to be talked about during lecture.
- Throughout lecture, ask questions about the concept that was just explained. When going over the answer, explain how you would approach and solve the problem.
- When asking a question in lecture, have students talk about their ideas with the people around them.
- When working with one student or a small group of students, have them explain what they did in order to solve a problem rather than explaining what they did wrong/right.

Works cited
 Ci504 (Summer 2014) Secondary Literacy. (n.d.). Retrieved November 1, 2014
 EPIC Educational Policy Improvement Center. (n.d.). Retrieved November 4, 2014.
 Ormand, C. (n.d.). The Role of Metacognition in Teaching Geoscience Topical Resources. Retrieved November 1, 2014.
 Self-Regulation in College Science Teaching. (n.d.). Retrieved November 1, 2014.
 Tuysuzoglu, Banu B., and Jeffrey A. Greene. "An Investigation of the Role of Contingent Metacognitive Behavior in Self-regulated Learning." *Metacognition and Learning*(2014): n. pag. SpringerLink. Web. 2 Nov. 2014.

