Review of: "Operations of the Cognitive-Metacognitive System in Promoting Learning: a Brief Theoretical Analysis"

Marita Seppanen[1]

1 University of Helsinki

Desta Sbhatu's article Operations of Cognitive-Metacognitive System in Promoting Learning: a Brief Theoretical Analysis is essential and relevant in educational psychology. My comments are:

The author needs to update concepts and add newer research results in the literature review to update the concepts in the six steps. For example, the review of Fleur, Bredeweg, and van den Bos (2021) from neuroscience. Fleur, D.S., Bredeweg, B. & van den Bos, W. (2021). Metacognition: ideas and insights from neuro- and educational sciences. *npj Sci. Learn. 6,* 13. https://doi.org/10.1038/s41539-021-00089-5.

Cognition and metacognition are intertwined as metacognition supports cognitive processes, which has already been widely researched. Metacognition requires self-regulated learning to promote learning. Educational researchers have studied metacognition through Self-Regulated Learning Theory (SRL). See Winne´s article:

Winne, P.H. (2022). Modeling self-regulated learning as learners doing learning science: How trace data and learning analytics help develop skills for self-regulated learning. *Metacognition and Learning 17*, 773–791. https://doi.org/10.1007/s11409-022-09305-y.

Metacognition requires self-regulated learning to facilitate learning, growth, and change. Students may have metacognitive knowledge of the topic but do not know how to regulate their learning in a class or group learning in a collaborative situation. Additionally, metacognition and regulation differ between school children and adults. A primary school student cannot be required to use metacognition independently than an expert, but even experts have problems metacognitively reflecting on their learning. Further, metacognition and regulation are highly domain-dependent and become more domain-independent as a learner gains more knowledge and experience. The author also wrote about metacognitive monitoring and cognitive strategies. For those reasons, strategies should be mentioned in the title of the article and the framework of the cognitive-metacognitive operation system by referring to cognitive-metacognitive strategies.

The author should cautiously write that the framework can be used to estimate the metacognition of a primary school student and a seasoned plant taxonomist because of the differences in school levels and age.

Learning should be defined and clarified in different contexts. For example, primary school students' learning differs from adult learning.