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Metacognition as a key element of the Assessment Companion for Thinking Skills (ACTS) project in Rauma (2020)

This article will try to clarify

- What research has said about the efficacy and conceptualisation of metacognition.
- What are the key knowledge and process dimensions of metacognition.
- What processes learners need to employ and how these can be taught.

Why metacognition is very important

Muijs and Bokhove (2020 p. 4), who contributed to a very influential Educational Endowment Fund (EEF) report, discuss the literature evaluating the evidence of the impact of metacognition and self-regulated learning.

“Metacognition and self-regulated learning (SRL) have been advocated by many, and have significant support being seen as a potentially effective and low cost way of impacting learning. Fundamentally, the underlying supposition is that metacognition and SRL are important to learning, and thus raise attainment, and various studies have established that SRL, and in particular metacognition, has a significant impact on students’ academic performance, on top of ability or prior achievement”

A very interesting study that challenges a long held assumption that metacognition was not effective for the early cognitive development of children. This was clearly challenged by Muijs and Bokhove (2020 p. 4)

“Studies suggest that early forms of metacognition are predictive of later attainment, one study of Finnish children, for example, finding that metacognition at age 3 was directly predictive of mathematics performance at age 6, and indirectly predictive of rate of growth maths performance between ages 3 and 6 (largely through its effect on counting ability) quoting (Aunola et al, 2004).”





This article will assume the argument that we should try to develop metacognition as an important aspect of self-regulated learning wherever possible across age and subject areas.

We will try to get clarity about the knowledge, processes and the different aspects of metacognition. This will allow us to inform our ways of teaching, scaffolding and assessing the growth of our learners.

Dimensions of metacognitive knowledge

Krathwohl (2002) and Pintrich (2002) discuss the addition of the category of metacognitive knowledge into the revised Bloom's taxonomy at length. This addition was also guided by the sub dimension described by Flavell (1979 p.219), namely

“Metacognitive knowledge includes knowledge of general strategies that might be used for different tasks, knowledge of the conditions under which these strategies might be used, knowledge of the extent to which the strategies are effective, and knowledge of self.”

Knowledge of Strategies, Task and Self

Taking these as key components in guiding the development of self-efficacy this article argues that these sub dimensions will allow clear guidance for whole class, small group and individual feedback and discussion. The specific focus on how a learner approaches and succeeds on educational tasks. These will allow for many opportunities for self-reflection using these 3 specific categories to spotlight in their thinking.

Questions that teachers can use and then encourage learners to internalise could be scaffolded at different levels within Bloom's taxonomy.

How would we describe the task? Can we recall similar tasks and strategies we have learnt or used in the past? What did I find easy/difficult? What did I find this task difficult? If I had used a different strategy, would that have helped?



These dimensions, and their ability to generate questions, will also be very useful to teachers, students and curriculum designers who want to formatively assess and help develop these aspects of metacognitive knowledge.

Cognitive processes as features of metacognition

The revision of Bloom's taxonomy made a clear distinction between "the noun and verb, to form separate dimensions, the noun providing the basis for the Knowledge dimension and the verb forming the basis for the Cognitive Process dimension." Krathwohl (2002 p.213).

This is taken as a fruitful distinction to frame how teaching environments can increase the use of verbs, actions and discourse to help the development of rich metacognitive environments. Muijs and Bokhove (2020) discuss the literature evaluating the evidence of the impact of metacognition and self-regulated learning. They then conclude from the work of Schraw, Crippen, and Hartley (2006), the role of metacognition is the most important, "because it enables individuals to monitor their current knowledge and skills levels, plan and allocate limited learning resources with optimal efficiency, and evaluate their current learning state" (p. 116). Muijs and Bokhove (2020, p.6) that the key processes in metacognition are:

Regulation of cognition includes at least three main components: planning, monitoring and evaluation:

- (1) Planning relates to goal setting, activating relevant prior knowledge, selecting appropriate strategies, and the allocation of resources.
- (2) Monitoring includes the self-testing activities that are necessary to control learning.
- (3) Evaluation refers to appraising the outcomes and the (regulatory) processes of one's learning.

Teaching metacognition

Muijs and Bokhove (2020 p.27) in considering what the evidence has to say about how best to teach metacognition suggest two main approaches:

"The evidence suggests that effective teaching of SRL and metacognition has two main elements: The direct approach, through explicit instruction and implicit modelling by the



teacher The indirect approach, through creating a conducive learning environment, with guided practise, including dialogue and (scaffolded) inquiry.”

They also argue that although metacognition is rated as cheap as an educational intervention it needs to be supported by ongoing Teacher Professional development to ensure the modelling, language and fruitful environment for metacognition are maintained.

References

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