

Does it work for more able learners too?

3. Metacognition

Introduction

Schools are increasingly looking to the research evidence to understand how they can improve the learning and achievement of their students. Educational researchers such as John Hattie, Daniel Willingham, Barak Rosenshine and John Sweller have begun to influence the practice of many schools, while many are also undertaking their own school-based enquiries and research. Organisations such as the Chartered College, EEF and Ofsted are endorsing and disseminating evidence-based practices, with the result that it is not unusual to see in schools the use of Rosenshine's Principles to inform lesson planning, or cognitive load and recall theory informing curriculum planning and classroom pedagogy.

We know these practices are having a positive effect on many learners. However, it is important that we also interrogate these pervasive approaches – and their theoretical underpinnings – to evaluate what impact they have on different groups of learners, including the most able. In this series of information sheets, NACE sets out to do just that. This is part of our ongoing review of evidence-based approaches to teaching and learning, alongside a specific focus on research and developments directly affecting more able learners.

Following information sheets on recall and retrieval practice, and on cognitive load theory (CLT), we continue the series with an overview of metacognition, and a consideration of its relevance to more able learners.

A focus of extensive research, metacognition has entered the vocabulary and classroom practices of schools to a larger degree, perhaps, than most other research-based interventions. The Education Endowment Foundation (EEF) has lauded metacognition as having considerable impact in its Teaching and Learning Toolkit, and has published extensive related guidance for schools on its use. NACE's research project "Making Space for Able Learners" recognises the place of well-developed metacognition in successful learning, and we have seen powerful examples of how this can be achieved.

Here we look at the key elements of metacognition and their relevance to the classroom, and then consider what this means for more able learners.

The context: what is metacognition?

Metacognition can be defined as a critical awareness of:

- a) One's thinking and learning and
- b) Oneself as a thinker and learner.

In an educational setting, these in turn lead us to a focus on the processes involved when learners plan, monitor, evaluate and make changes to their own learning behaviours. The effective use of basic cognitive processes is a fundamental part of learning. These processes include:

- Memory and attention,
- The activation of prior knowledge,
- The use of cognitive strategies to solve a problem or complete a task.

For a learner to make the best use of these basic cognitive processes, they need to have an awareness and an ability to monitor and adapt them.

There are two dimensions to metacognition:

1. Metacognitive knowledge: what learners *know* about learning.

This includes:

- The learner's knowledge of their own cognitive abilities,
- The learner's knowledge of particular tasks,
- The learner's knowledge of different strategies that are available to them and when they are appropriate to the task.

2. Metacognitive regulation: what learners *do* about learning.

This describes how learners monitor and control their cognitive processes.

Metacognition phases



David Perkins (1992) defined four levels of metacognitive learners which provide a useful framework for teachers:

- **Tacit learners** are unaware of their metacognitive knowledge. They do not think about any particular strategies for learning and merely accept if they know something or not.
- **Aware learners** know about some of the kinds of thinking that they do such as generating ideas, finding evidence etc. However, thinking is not necessarily deliberate or planned.
- **Strategic learners** organise their thinking by using problem-solving, grouping and classifying, evidence-seeking and decision-making etc. They know and apply the strategies that help them learn.
- **Reflective learners** are not only strategic about their thinking but they also reflect upon their learning while it is happening, considering the success or not of any strategies they are using and then revising them as appropriate.

Once teachers have identified where learners are on this continuum, they can plan their support accordingly.

Source: <https://cambridge-community.org.uk/professional-development/gswmeta/index.html>

Like any other strategy to improve learning, developing metacognitive strategies does not happen in isolation. For example, practices emerging from cognitive load theory, which we have already considered in this series, are central to effective metacognitive practice.

Teachers will also be familiar with Vygotsky's theory of the zone of proximal development (ZPD). The ZPD represents the gap between what a learner can achieve alone and what a learner can achieve with expert guidance: "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem-solving under adult guidance, or in collaboration with more capable peers" (Vygotsky, 1978).

Successful guidance consists of, for example, a teacher taking responsibility for monitoring progress, setting goals, planning activities and allocating attention (e.g. modelling how to allocate/direct attention to the key aspects of the learning task and considering strategies which might be appropriate in that instance).

Gradually, the responsibility for these cognitive processes is given over to the learner. The learner becomes increasingly capable of regulating his or her own cognitive activities. This transition would now be considered metacognitive development. Pedagogical models such as Fisher-Frey (2013) also allow for the development and application of metacognitive strategies.

In practice: what's working?

A key challenge for teachers is being able to recognise how well their students understand their own learning processes. Classroom practices which support this include:

- Metacognitive questioning. What do you notice? What do you know? Why did you choose that strategy? What do you think about the strategy you used?
- Setting clear learning objectives.
- Demonstrating and monitoring pupils' metacognitive strategies.
- Modelling metacognitive strategies and continually prompting and encouraging pupils in this respect.
- Encouraging pupils to activate prior knowledge related to the task.
- Explicitly teaching strategies to use at each point in the cycle.
- Teaching coping strategies such as: using mind-maps; taking effective notes; thinking aloud to work through problems; breaking tasks down into smaller steps.
- The use of structured planning templates; teacher modelling; worked examples; breaking down activities into their constituent parts, revealing one part at a time and in sequence.

All of these strategies also benefit from being rooted in approaches which encourage pupils to interrogate and develop positive attitudes to learning and to what they can achieve e.g. growth mindset practices (Dweck, 2006).

What does this mean for more able learners?

For all learners, effective metacognition occurs within a context of effective teaching and learning. For more able learners this means a context of practices which meet their learning needs e.g. cognitive challenge and growing autonomy. The appropriate level of challenge is essential. If more able pupils do not face difficulty, struggle with and overcome the challenge, they will not develop new and useful learning strategies, they will not be afforded the opportunity to learn from their mistakes, and they will not be able to reflect sufficiently on the content with which they are engaging.

NACE's "Making Space for Able Learners" project found many examples of the effective development of metacognition:

"For pupils to become aspirational and autonomous learners, the management of the learning environment must provide them with the tools to achieve this. An understanding of learning attributes provides one approach to this by encouraging pupils to reflect on different contributory factors for good learning."

– Making Space for Able Learners
Cognitive challenge: principles into practice (NACE, 2020)

The following list offers useful approaches to planning and teaching the more able to develop metacognitive skills and knowledge:

- **Avoid working memory overload:** the work must be beyond pupils' current capability but within their reach. They must struggle but must be able to overcome the challenge with time, effort and support.
- **Deliberately teach metacognitive strategies** – and, as appropriate to the child, the underlying 'science'.
- **Use an appropriate framework**, e.g. the David Perkins (1992) framework outlined above, which will help to define which one of the four levels of metacognitive learner relates to each of your more able pupils. This in turn will determine the type and level of support each pupil will need with regards to developing and using metacognitive strategies.
- **Explore with pupils the best ways in which they as an individual learn.** This needs to be repeated regularly and on a one-to-one basis.
- **Include opportunities for reflection** with a focus on learning processes and strategies during and after every task presented to more able children. What strategy or type of thinking did they use to complete the task? How did they manage their learning? What learning approaches could they have tried that may have been more effective? Use prompts such as these to encourage learners to evaluate the metacognitive processes they used, rather than just the outcome or quality of work produced.
- **Encourage more able learners to evaluate** the strategies used by other learners or suggested by the teacher. As when reflecting on their own learning processes, provide prompts to guide pupils to focus on the learning strategies employed, rather than the outcome.
- **Provide more able learners with some means of recording their evaluation** of the effectiveness of the strategies they and others chose to use.
- **Teaching metacognitive strategies within each subject area is essential** – it may look different, for example, in maths and French.

More able learners may need more explicit teaching of the metacognition phases in order to understand why each stage is important and to use the strategies they need based on their specific ability level. They must be encouraged to spend a greater amount of time reflecting on their own cognitive abilities, their knowledge of the task and the strategies they have already learnt which they can draw upon, and their own knowledge of how to learn. These opportunities must be central to task design for more able pupils.

It is likely that more able pupils will grasp the theory of metacognition quickly when exposed to it. Time must be spent ensuring that they understand each stage and its importance, and are encouraged to use it as the norm when attempting any learning task.

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For information or further copies of this publication:
Horticulture House, Manor Court, Chilton, Didcot OX11 0RN
01235 425000 | info@nace.co.uk | www.nace.co.uk

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