This presentation was not shared at researched National 2024 but my talk was based on this.

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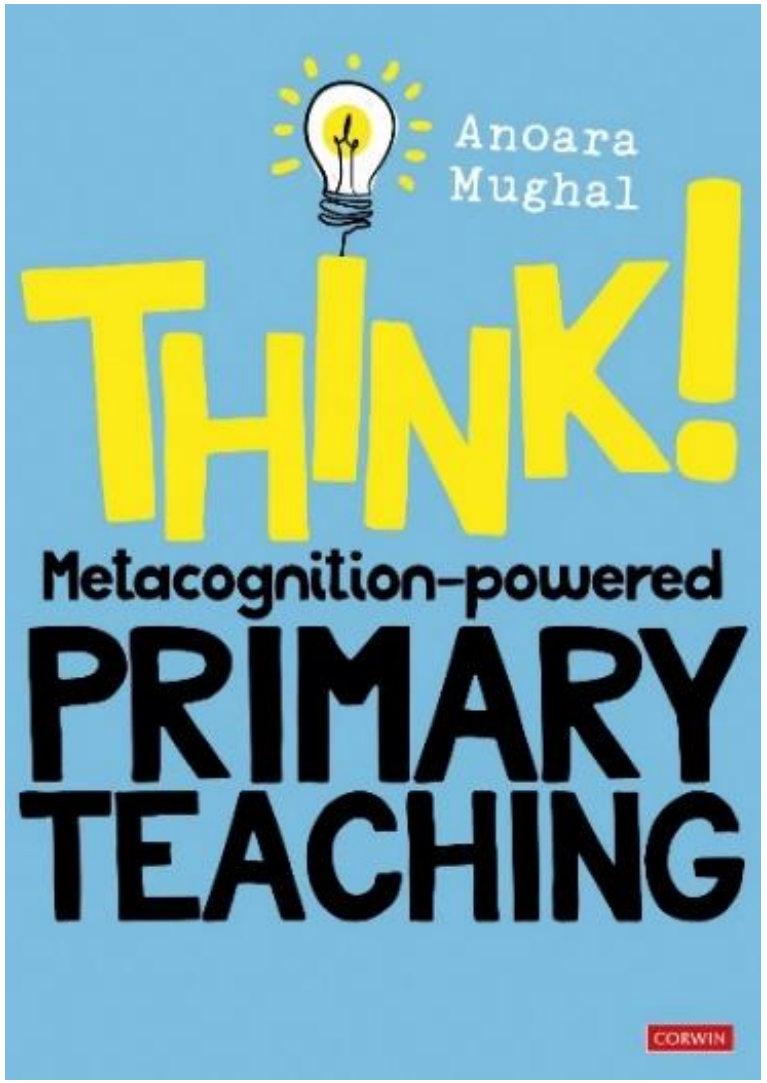
Do get in touch if you have any questions.

Metacognition and Self-regulated Learning (in the Primary Classroom)

Anoara Mughal, researchED 2024



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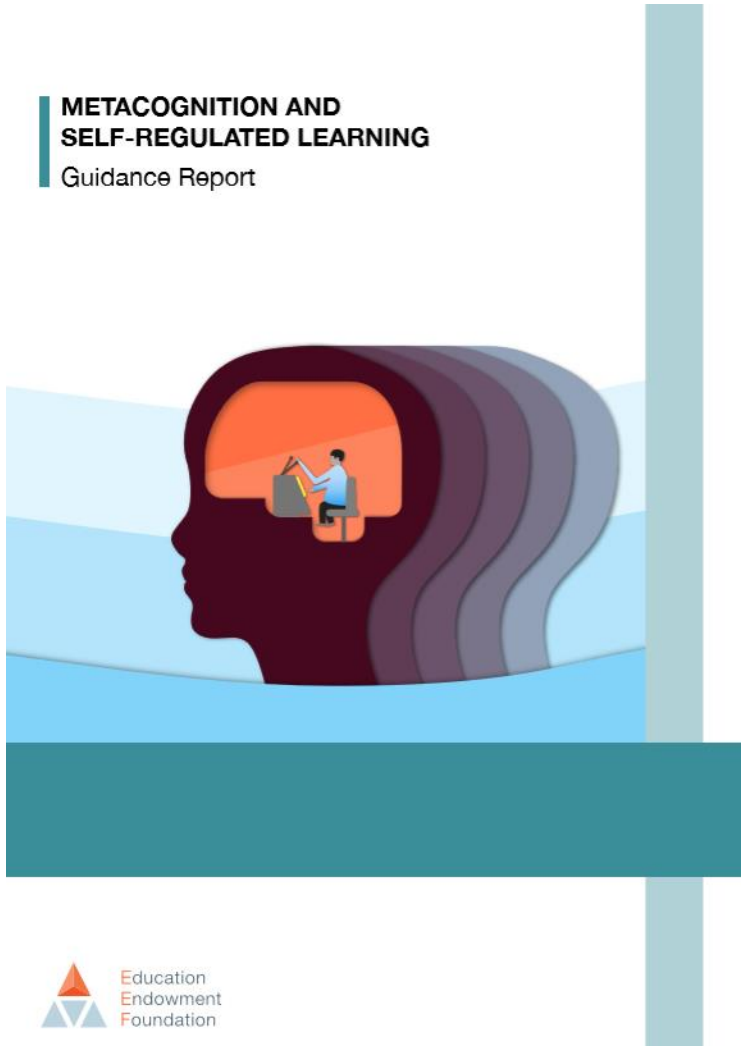
Aims

- Consider research findings about metacognition and self-regulated learning
- Develop a coherent understanding of what metacognition and self-regulated learning are
- Explore evidence-informed strategies to teach metacognition explicitly

What do you already know about metacognition?

Reading



Education Endowment Foundation

METACOGNITION AND SELF-REGULATED LEARNING

Summary of recommendations

1
Teachers should acquire the professional understanding and skills to develop their pupils' metacognitive knowledge

- Self-regulated learners are aware of their strengths and weaknesses, and can motivate themselves to engage in, and improve, their learning.
- Developing pupils' metacognitive knowledge of how they learn—their knowledge of **themselves as a learner**, of strategies, and of **tasks**—is an effective way of improving pupil outcomes.
- Teachers should support pupils to **plan, monitor**, and **evaluate** their learning.

2
Explicitly teach pupils metacognitive strategies, including how to plan, monitor, and evaluate their learning

- Explicit instruction in cognitive and metacognitive strategies can improve pupils' learning.
- While concepts like 'plan, monitor, evaluate' can be introduced generically, the strategies are mostly applied in relation to specific content and tasks, and are therefore best taught this way.
- A series of steps—beginning with **activating prior knowledge** and leading to **independent practice** before ending in **structured reflection**—can be applied to different subjects, ages and contents.

3
Model your own thinking to help pupils develop their metacognitive and cognitive skills

- Modelling by the teacher is a cornerstone of effective teaching; revealing the thought processes of an expert learner helps to develop pupils' metacognitive skills.
- Teachers should verbalise their metacognitive thinking *('What do I know about problems like this? What ways of solving them have I used before?')* as they approach and work through a task.
- Scaffolded tasks, like worked examples, allow pupils to develop their metacognitive and cognitive skills without placing too many demands on their mental resources.

4
Set an appropriate level of challenge to develop pupils' self-regulation and metacognition

- Challenge is crucial to allow pupils to develop and progress their knowledge of tasks, strategies, and of themselves as learners.
- However, challenge needs to be at an appropriate level.
- Pupils must have the motivation to accept the challenge.
- Tasks should not overload pupils' cognitive processes, particularly when they are expected to apply new strategies.

5
Promote and develop metacognitive talk in the classroom

- As well as explicit instruction and modelling, classroom dialogue can be used to develop metacognitive skills.
- Pupil-to-pupil and pupil-teacher talk can help to build knowledge and understanding of cognitive and metacognitive strategies.
- However, dialogue needs to be purposeful, with teachers guiding and supporting the conversation to ensure it is challenging and builds on prior subject knowledge.

6
Explicitly teach pupils how to organise and effectively manage their learning independently

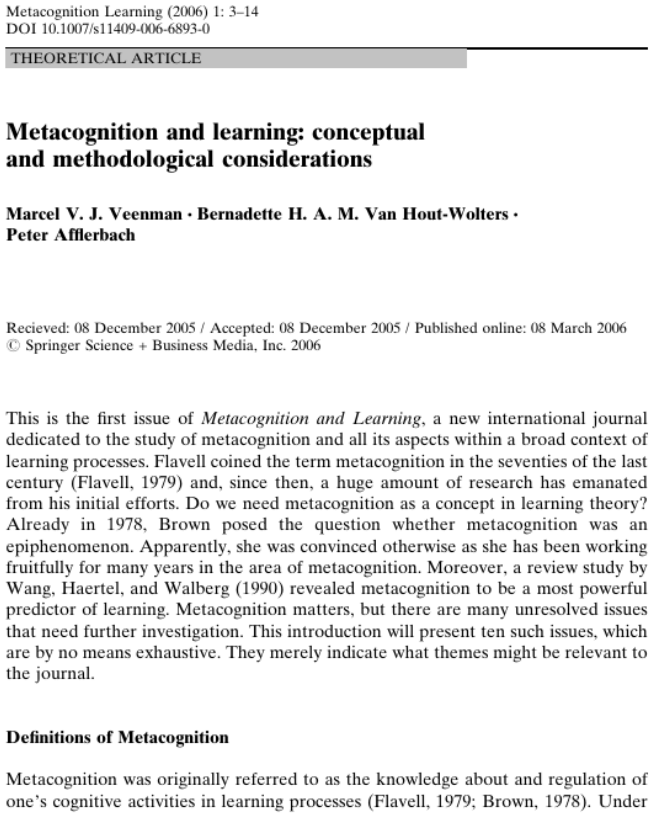
- Teachers should explicitly support pupils to develop independent learning skills.
- Carefully designed **guided practice**, with support gradually withdrawn as the pupil becomes proficient, can allow pupils to develop skills and strategies before applying them in **independent practice**.
- Pupils will need timely, effective feedback and strategies to be able to judge accurately how effectively they are learning.
- Teachers should also support pupils' motivation to undertake the learning tasks.

7
Schools should support teachers to develop knowledge of these approaches and expect them to be applied appropriately

- Develop teachers' knowledge and understanding through high quality professional development and resources.
- Senior leaders should provide teachers with time and support to make sure approaches are implemented consistently.
- Teachers can use tools such as 'traces' and observation to assess pupils' use of self-regulated learning skills.
- Metacognition shouldn't be an 'extra' task for teachers to do but should be built into their teaching activities.

[Metacognition and Self-regulated Learning | EEF (educationendowmentfoundation.org.uk)](https://educationendowmentfoundation.org.uk)

Reading



Metacognition Learning (2006) 1: 3–14
DOI 10.1007/s11409-006-6893-0

THEORETICAL ARTICLE

Metacognition and learning: conceptual and methodological considerations

Marcel V. J. Veenman · Bernadette H. A. M. Van Hout-Wolters · Peter Afflerbach

Recieved: 08 December 2005 / Accepted: 08 December 2005 / Published online: 08 March 2006

This is the first issue of *Metacognition and Learning*, a new international journal dedicated to the study of metacognition and all its aspects within a broad context of learning processes. Flavell coined the term metacognition in the seventies of the last century (Flavell, 1979) and, since then, a huge amount of research has emanated from his initial efforts. Do we need metacognition as a concept in learning theory? Already in 1978, Brown posed the question whether metacognition was an epiphenomenon. Apparently, she was convinced otherwise as she has been working fruitfully for many years in the area of metacognition. Moreover, a review study by Wang, Haertel, and Walberg (1990) revealed metacognition to be a most powerful predictor of learning. Metacognition matters, but there are many unresolved issues that need further investigation. This introduction will present ten such issues, which are by no means exhaustive. They merely indicate what themes might be relevant to the journal.

Definitions of Metacognition

Metacognition was originally referred to as the knowledge about and regulation of one's cognitive activities in learning processes (Flavell, 1979; Brown, 1978). Under

Education Endowment Foundation

Metacognition and Self-Regulation: Evidence Review

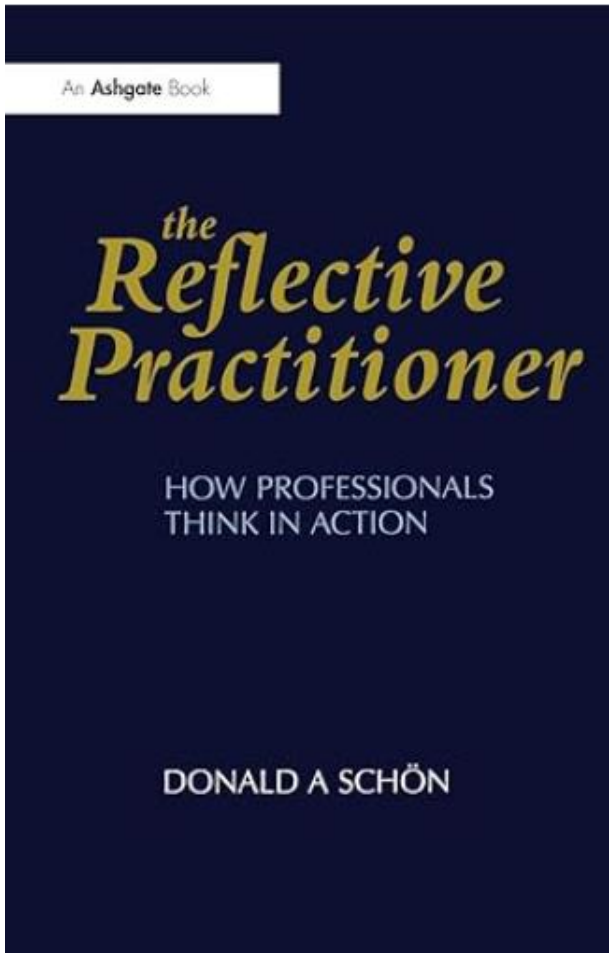
May 2020

Daniel Muijs
Christian Bokhove
(University of Southampton, England)

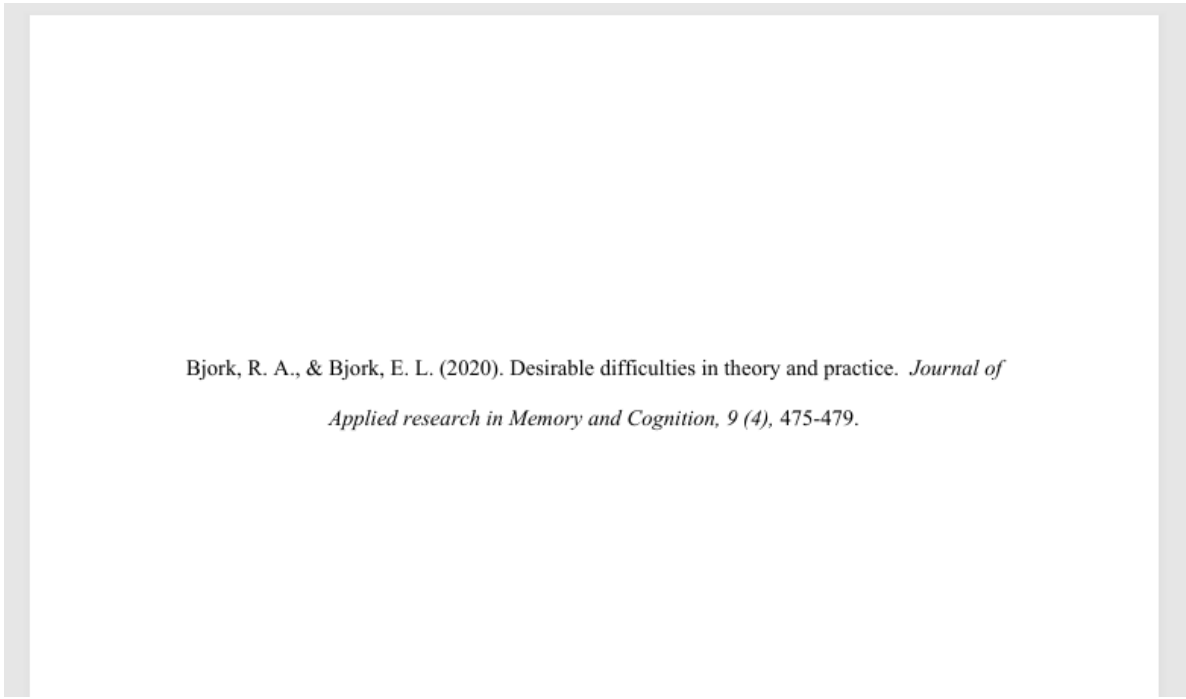
Veenman, M. V. J., Van Hout-Wolters, H. A. M. and Afflerbach, P. (2006) 'Metacognition and learning: conceptual and methodological considerations', Metacognition and Learning, 1 (1), pp. 3–14.

Muijs, D. and Bokhove, C. (2020). Metacognition and Self Regulation: Evidence Review. London: Education Endowment Foundation.

Readings



Schon, D. A. (1983) The Reflective Practitioner: How professionals think in action, Temple Smith


Bjork, R. A., & Bjork, E. L. (2020). Desirable difficulties in theory and practice. *Journal of Applied research in Memory and Cognition, 9 (4),* 475-479.

Bjork, R. A., & Bjork, E. L. (2020). Desirable difficulties in theory and practice. Journal of Applied research in Memory and Cognition, 9 (4), 475-479.

Some Metacognitive Misconceptions

1. All strategies to do with cognition are metacognition.
2. Metacognition cannot be taught.
3. Metacognition is only developed in older pupils.
4. Metacognition is a general skill that can be separated from subject knowledge.
5. You can easily teach metacognitive knowledge and strategies in discreet ‘thinking skills’ lessons.
6. Retrieval practice is the only way to develop metacognition.

Some Impacts of Metacognition

7 months progress (EEF 2018, Metacognition and Self-regulated Learning)+

Improves progress and attainment by seven months

A metacognitive approach can improve pupil progress and attainment by seven months for free-school meal pupils and disadvantaged pupils.

Powerful predictor of maths performance at age 6

Research indicates that metacognition is a powerful predictor of maths performance at age 6 largely through its effect on counting ability

May help make up for cognitive limitations

An adequate level of metacognition may compensate for pupil's cognitive limitations'.

Develop language capability

Teaching metacognitive strategies explicitly helps develop language capability in all areas of learning by helping pupils to transfer what they have learnt from one context to the next, or from a previous task to a new task, thereby practising and embedding key vocabulary.

Helps to filter out information and help to focus on important aspects

Developing metacognition and self-regulated learning helps filter out unnecessary information, which is a very important skill to have as we are continually being bombarded with information. Being able to filter out information can lead us to develop insights, as we begin to then focus on what is important.

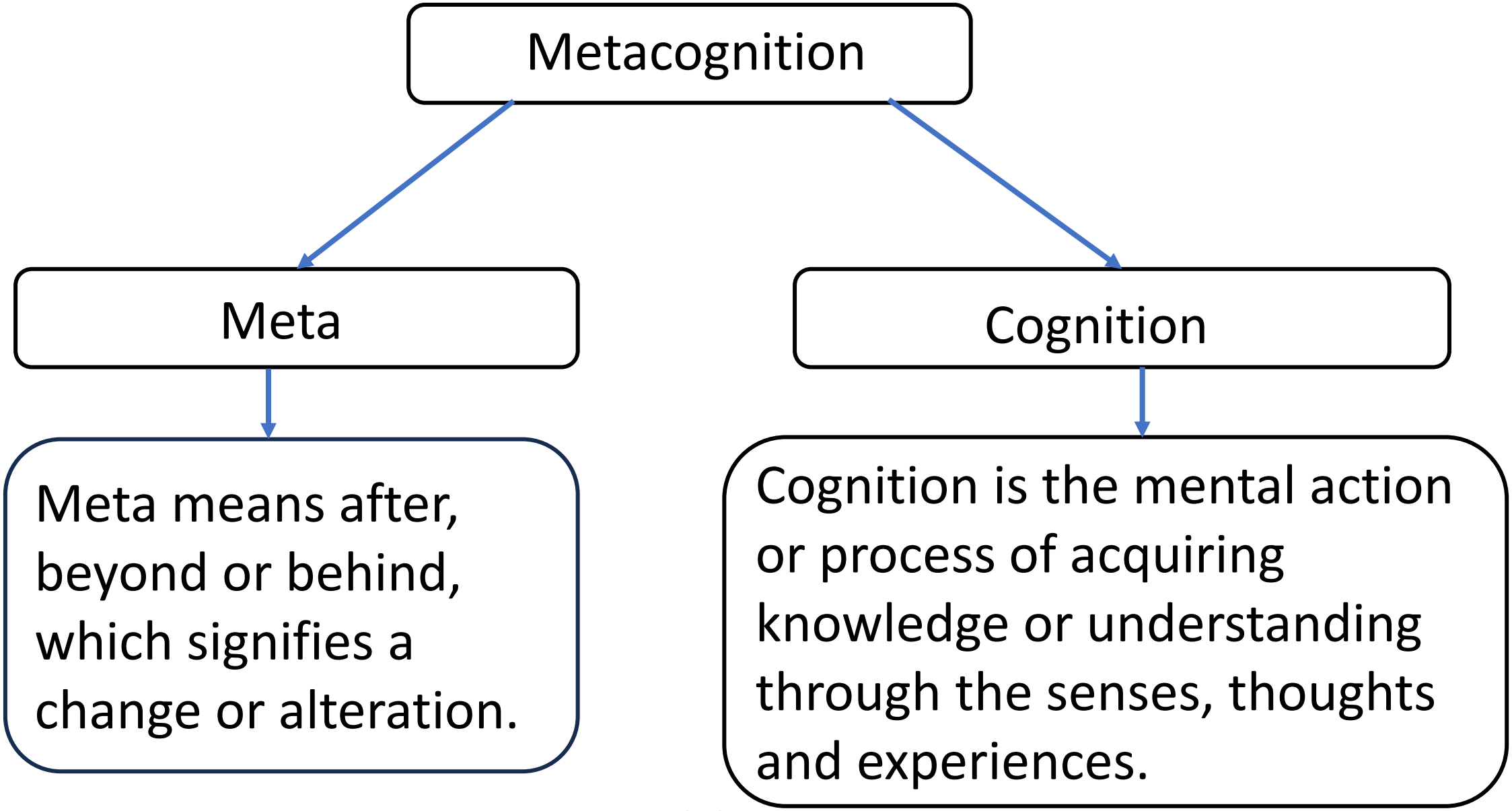
Improves motivation, behaviour and redirects attention

It enables the teacher shift and redirect attention to where it is required in the learning. It helps pupils refocus their attention should they find it wandering. It can also be used to promote teacher neutrality, where the focus for behaviour is shifted from the child to the task in hand; this can be highly motivating for pupils. Motivation in turn leads to improved confidence, which then impacts on memory, and progress and attainment.

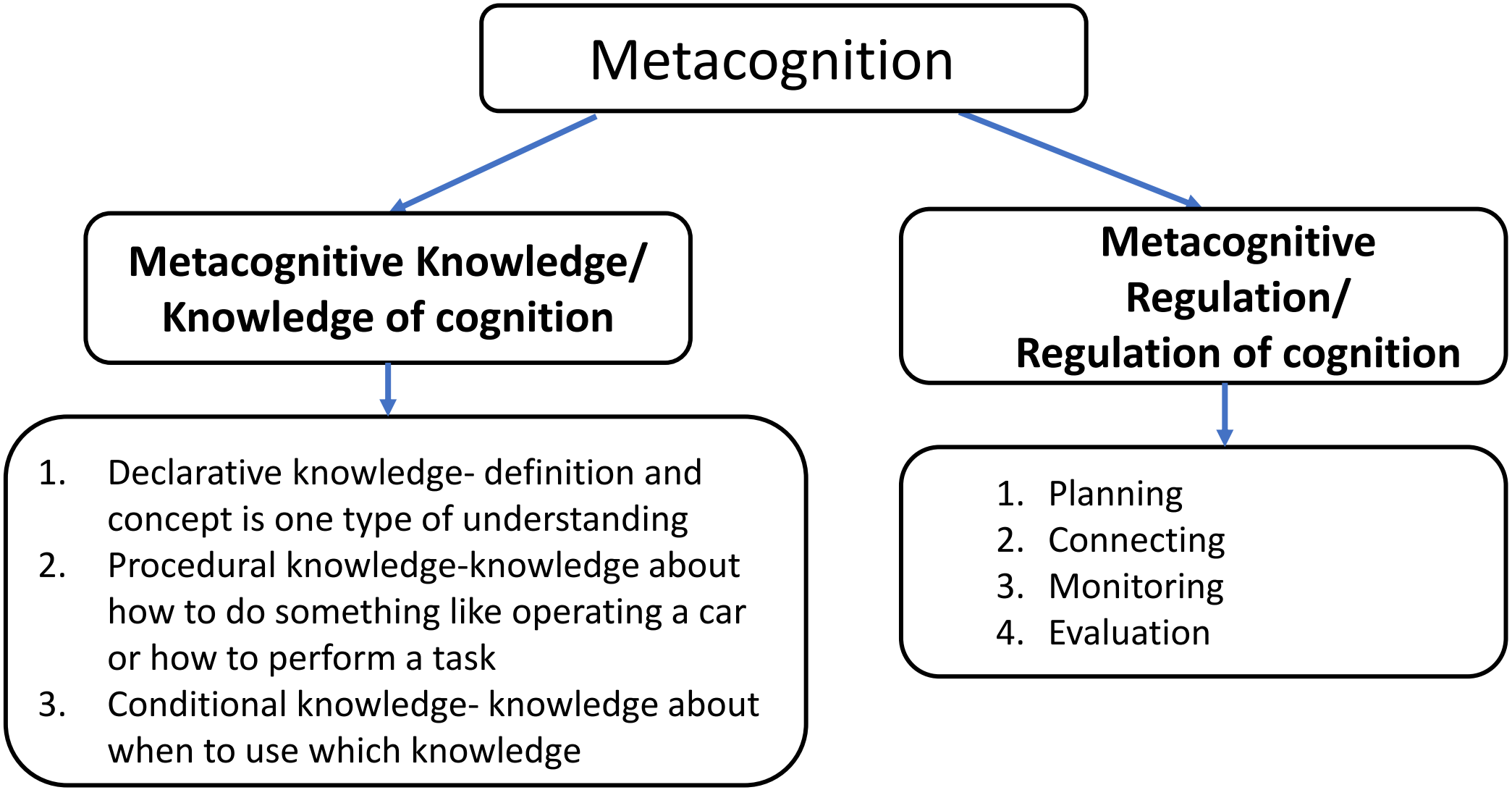
Download this resource from: Think Future Learn

Anoara Mughal 2024

Definitions of Metacognition



Understanding Metacognition



•*Adapted from Veenman, M. V. J., Van Hout-Wolters, H. A. M. and Afflerbach, P. (2006) 'Metacognition and learning: conceptual and methodological considerations', Metacognition and Learning, 1 (1), pp. 3–14.*

Understanding Metacognition

There is currently no agreed description or definition but these are all correct.

Researched for over thirty years, metacognition is one of those concepts that is described as being 'fuzzy' and 'really hard to grasp' (Aktuz and Sahin, 2011).

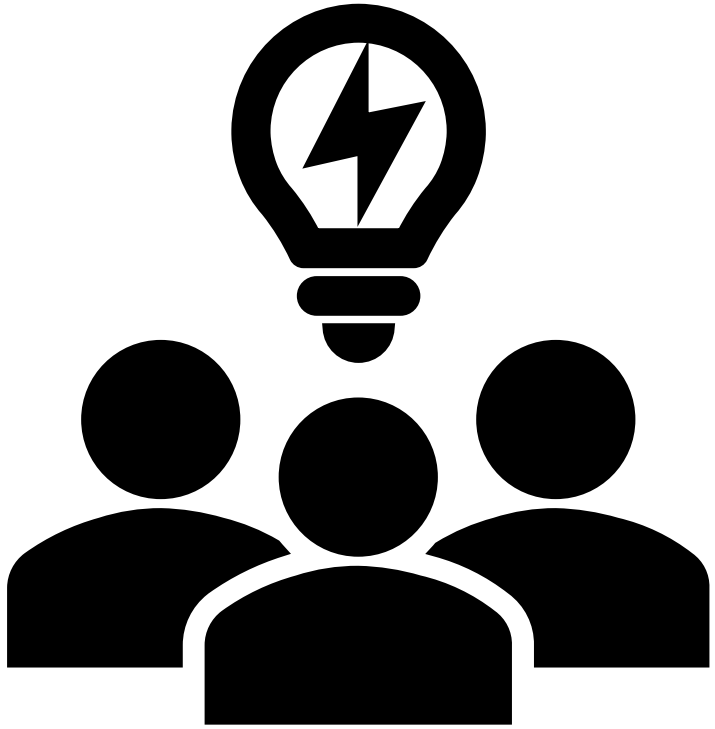
Flavell (1976)described metacognition as being something that you struggle With 'I am engaging in metacognition if I notice that I am having more trouble learning A than B; if it strikes me that I should double check C before accepting it as fact.'

In 1976, Flavell referred to it as 'the individual's own awareness and consideration of his or her cognitive processes and strategies,' (Flavell 1979).

Metacognition is 'knowledge about executive control systems' and the 'evaluation (of) cognitive states such as self appraisal and self-management,'(Brown 1983).

A Definition of Metacognition

Metacognition are a range of thinking skills and behaviours, which enable you to take control of your learning, through the detailed examination and evaluation of thought processes and cognitive potential.



Adapted from:

Muijs, D. and Bokhove, C. (2020). Metacognition and Self Regulation: Evidence Review. London: Education Endowment Foundation.

Metacognition is…

…the internal dialogue which changes our behaviour to achieve our goals.

Metacognition is…

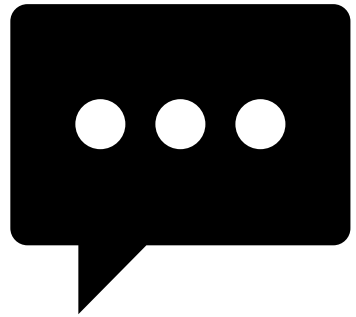
INVISIBLE…

Making Metacognition Visible

Cognition

Metacognition

EXPLICIT



researchED

By teaching metacognition explicitly, we are trying to…

Make the invisible VISIBLE.

Metacognition and Self-regulation

Self-regulation can be broken down into three essential components:

- **Cognition**
- **Metacognition**
- **Motivation**

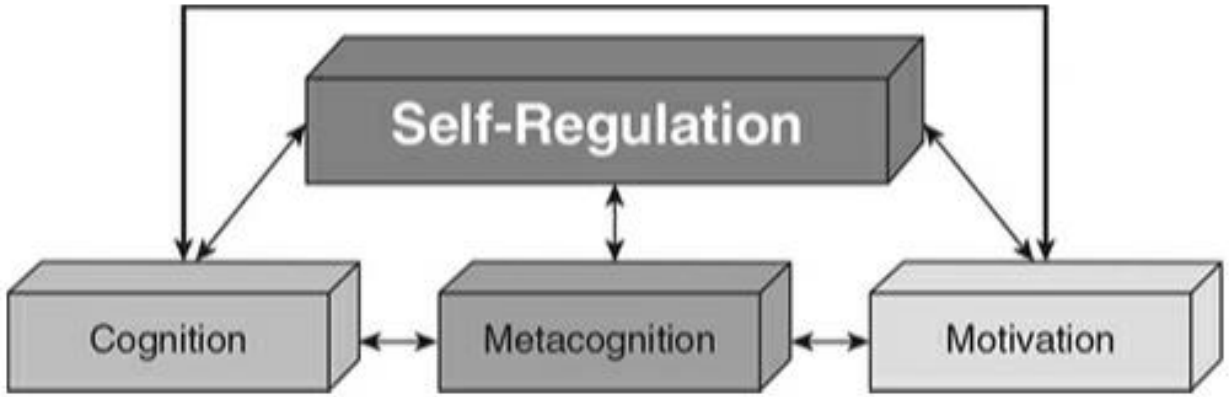


Figure 2.1 A model of self-regulation
Mughal, Anoara. Think!: Metacognition-powered Primary Teaching (Corwin Ltd) (p. 23). SAGE Publications. Kindle Edition.

Metacognition and Self-regulated Learning

Essentially, self-regulation is about the extent to which learners are aware of their strengths and weaknesses, the strategies they use to learn, can motivate themselves to engage in learning, and can develop strategies and tactics to enhance learning.

Metacognition, in turn, is specifically about the ways learners can monitor and purposefully direct their learning, for example by deciding that a particular strategy for memorisation is likely to be successful, monitor whether it has indeed been successful, and then deliberately change (or not change) their memorisation method based on that evidence.

Some studies consider self-regulation to be a part of metacognition, while others see metacognition as a part of self-regulation (Veenman et al, 2006). In recent years, however, the latter view has largely prevailed, so for clarity it is this definition that we will follow in this report.

Muijs, D. and Bokhove, C. (2020). Metacognition and Self Regulation: Evidence Review. London: Education Endowment Foundation.

Metacognition and Self-regulated Learning

Self-regulated learning is the application of metacognition and self-regulation to learning.

Manion, J., (2020) Metacognition, Self-regulation and Self-regulated Learning- What is the difference? Impact Journal. The Chartered College of Teaching.

Being Evidence Informed

When reading articles, research papers/ reviews or books, consider your context and adapt findings for your context/ cohort.

A summary of Metacognition and Self-regulation Evidence Review 2020

The "Metacognition and Self-regulation Evidence Review 2020" by the Education Endowment Foundation (EEF) examines how metacognitive and self-regulatory strategies impact student learning.

The 2020 evidence review by Daniel Muijs and Christian Bokhove investigates the impact of metacognition and self-regulation on student learning. They define metacognition as the awareness and control of one's own learning processes, which involves students' ability to plan, monitor and evaluate their own learning, while self-regulation involves managing emotions, behaviours, and thoughts to achieve goals. The review highlights the importance of teaching students these skills, as they are linked to improved academic outcomes. Muijs and Bokhove also emphasise the need for explicit instruction in metacognitive strategies and suggest that structured reflection and feedback are key in helping students develop better self-regulation. They also note the positive impact of these skills across various subjects and age groups. Muijs and Bokhove emphasise the importance of explicit instruction in metacognitive strategies, such as setting goals, monitoring progress, and reflecting on outcomes. They also highlight that effective feedback and teacher guidance are critical in fostering these skills in students.

The review finds strong evidence that teaching these skills improves academic performance across different subjects and age groups.

Muijs, D. and Bokhove, C. (2020). Metacognition and Self Regulation: Evidence Review. London: Education Endowment Foundation.

What are the implications of this on classroom practice?

There are two ways to develop metacognition:

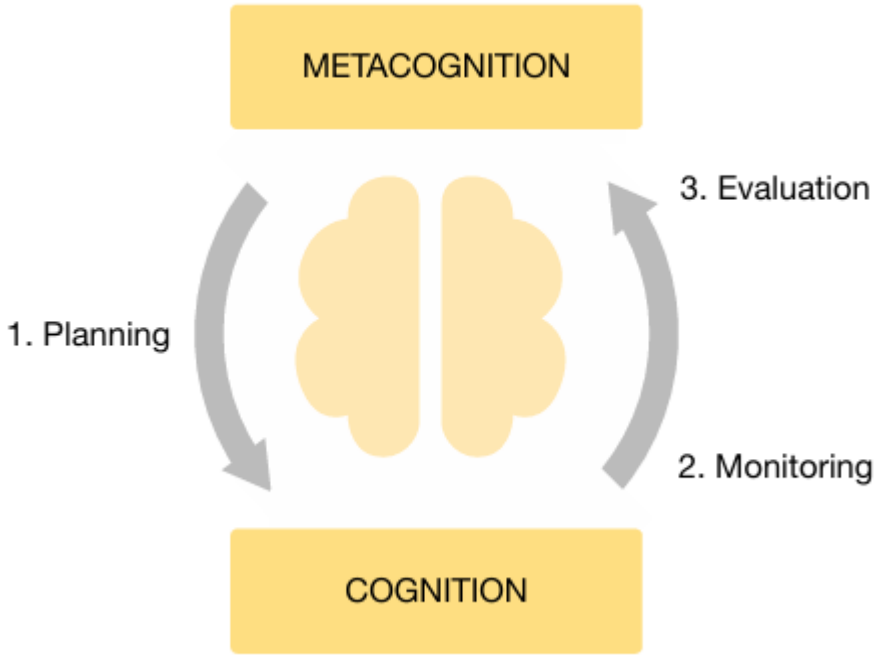
1. The Direct Approach- use explicit instruction, dialogue and scaffolds with guided practise modelled by the educator.

2. The Inquiry Approach- create a conducive learning environment, including dialogue and scaffolds for pupils to create their own conceptual structures.

Creates gaps in thinking, which is essential for metacognitive development.

Muijs, D. and Bokhove, C. (2020). Metacognition and Self Regulation: Evidence Review. London: Education Endowment Foundation.

Metacognitive Questioning



Metacognitive questioning

We approach any learning task or opportunity with some metacognitive knowledge about:

- Ourselves as a learner
- Strategies
- The task

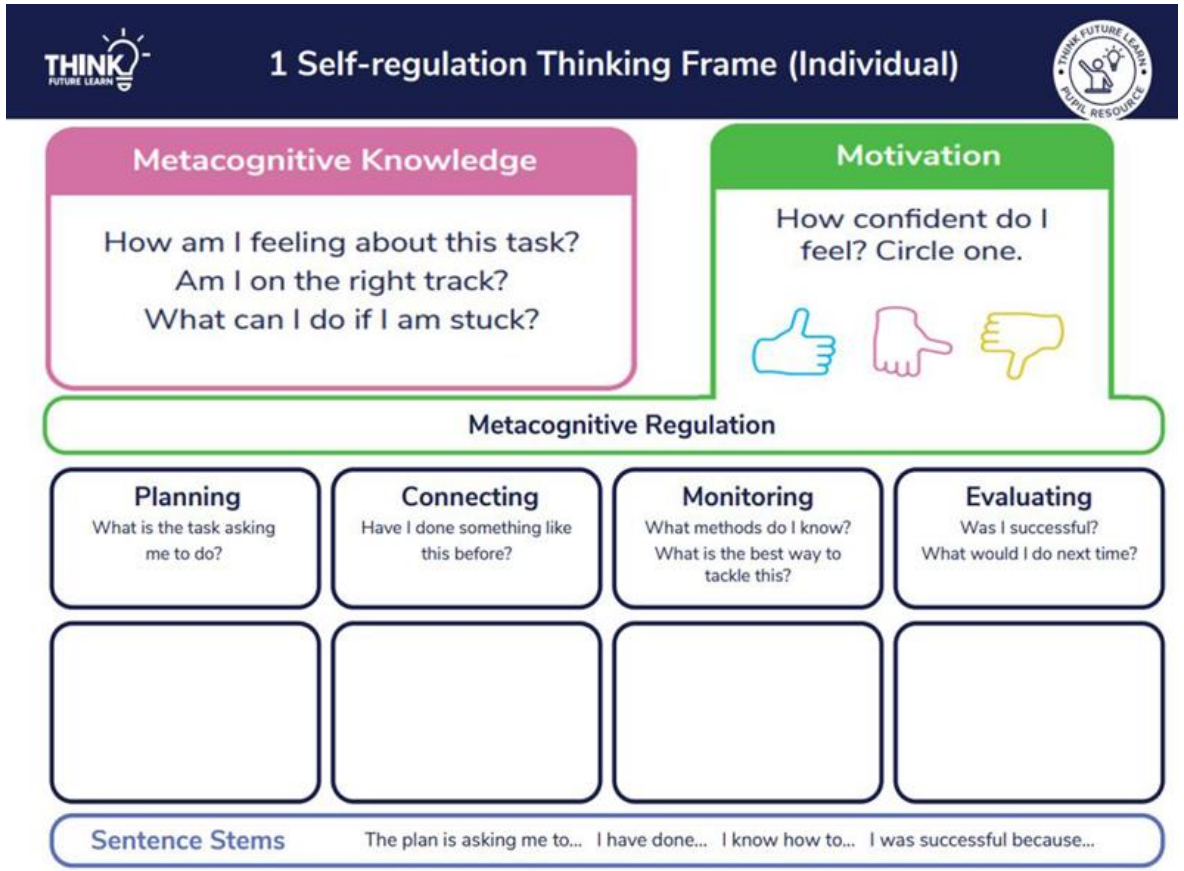
When undertaking a task we start with this knowledge then apply and adapt it.

[Metacognition and Self-regulated Learning | EEF (educationendowmentfoundation.org.uk)]

Self-regulation Thinking Framework

EVIDENCE INFORMED

- **Modelling thought processes explicitly**
- **Giving explicit instruction**



Although pupils develop some metacognitive skills and strategies naturally, when it is taught explicitly it can boost confidence, self-esteem, and self-efficacy.
It helps to develop an awareness of the processes and actions pupils use during learning, helps them to understand themselves as learners, and helps those from disadvantaged backgrounds to make an additional progress of seven months across a year according to the EEF's Teaching and Learning Toolkit.

Metacognition can be divided into two strands: metacognitive knowledge and metacognitive regulation.
•Metacognitive knowledge requires thinking processes to be developed in the classroom to enable pupils to understand who they are as learners and how they learn.
•Metacognitive regulation is the planning, monitoring and evaluating process, which is subject or task-specific'

Download this resource from: www.thinkfuturelearn.co.uk
Rosenshine, B., (2010) Principles of Instruction.
The International Academy of Education

Metacognition and self-regulation in the primary classroom thinking learning teaching lessons feedback resources primary school Anoara Mughal (headteacher-update.com)

The Importance of Challenge

There is some evidence, at least in terms of metacognition, that such scaffolding should not be too specific as this may inhibit reflection. Some ‘deliberate difficulty’ is required so that pupils have gaps where they have to think for themselves and monitor their learning with increasing independence.

Reinforcing the value of the processes modelled by engaging the pupils in reflecting on how successful they were at the end of the activity, or lesson, is also important.

Metacognition and Self-regulated Learning | EEF (educationendowmentfoundation.org.uk)

A summary of Bjork and Bjork 2020

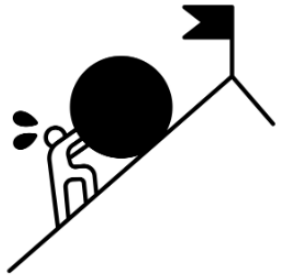
In their 2020 paper, Bjork and Bjork explore the concept of "desirable difficulties" and how introducing certain challenges during learning can enhance long-term retention and transfer of knowledge. They explain that techniques such as spacing, interleaving, and retrieval practice, though more challenging, lead to stronger, more durable memories compared to methods that feel easier and more fluent.

Pupils often misjudge these effective strategies, favouring ease and repetition, which can create an illusion of learning but result in weaker retention. The authors point out that desirable difficulties can make learning seem slower or more effortful in the short term but yield more lasting knowledge in the long run. They emphasise that both pupils and educators need to recognise the benefits of these challenges, despite their immediate discomfort. The paper also highlights how misconceptions about learning can undermine the adoption of these techniques in classrooms.

Bjork, R. A., & Bjork, E. L. (2020). Desirable difficulties in theory and practice. Journal of Applied research in Memory and Cognition, 9 (4), 475-479.

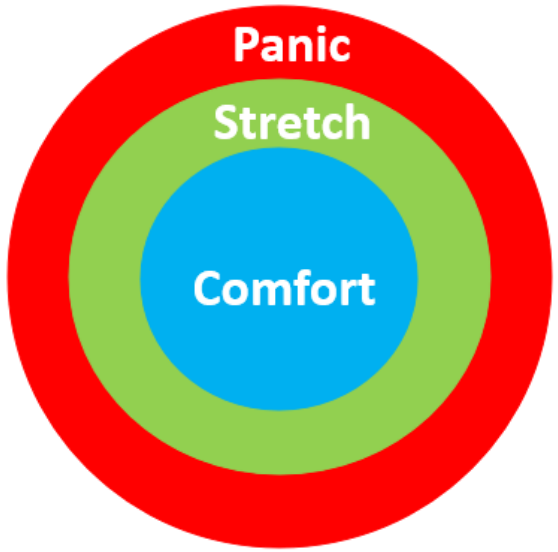
The Importance of Challenge

EVIDENCE INFORMED



Desirable versus Undesirable Difficulties

The term *desirable difficulty*, coined in 1994 (Bjork 1994a, 1994b), has a nice alliteration, but it has led to our having to emphasize that the word *desirable* is important. Many difficulties are undesirable during instruction and forever after. Desirable difficulties, versus the array of undesirable difficulties, are desirable because they trigger encoding and retrieval processes that support learning, comprehension, and remembering. If, however, the learner does not have the background knowledge or skills to respond to them successfully, they become undesirable difficulties. We entitled a short chapter *Making things hard on yourself, but in a good way: Creating desirable difficulties to enhance learning*[1] to emphasize that the level of difficulty matters (Bjork & Bjork, 2011; 2014).



Get pupils involved in the challenge!

- Put out three trays labelled with 'Easy', 'Just Right' and 'Too hard.'
- At the end of the each lesson ask pupils to place their books in the matching tray to how they felt about the task.
- This is a great way to gauge whether they are finding tasks too easy or not. It also helps you to identify the pupils who find it hard to accurately self-assess.

Bjork, R. A., & Bjork, E. L. (2020). Desirable difficulties in theory and practice. Journal of Applied research in Memory and Cognition, 9 (4), 475-479.

Feedforward is a Gift

- Feedback if done incorrectly can cause more harm than good (*Kluger & DeNisi 1996).*
- Feedback does what it says on the tin: it focuses on the past.
- Feedback always tells someone what they did well or badly on.
- With feedback, teachers do all the work.
- In order for learning to happen, pupils need to know how to improve in the future.
- Feedforward focuses on how to improve and make progress.
- Feedforward helps to highlight errors, which helps to develop reflection and self-awareness.
- It focuses on the task and not the person, thereby impersonalising it.
- Pupils receiving the feedforward does all the work.

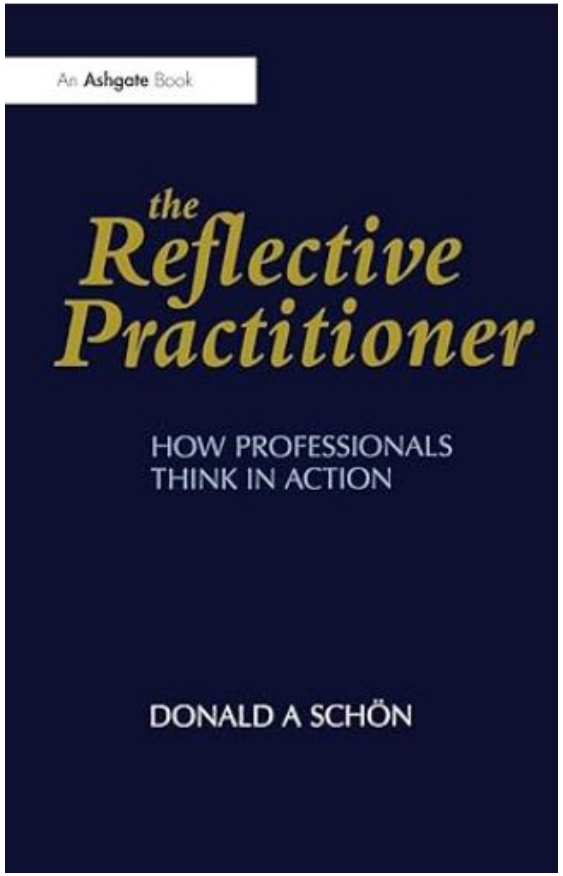
Some Benefits of Self-reflection

- Developing positive attitudes to tasks
- Questioning what we can do to continually develop ourselves
- Strengthening decision-making processes
- Sharing reflections within groups can help develop understanding of perspectives
- Reflecting can improve communication and facilitate improvement in team working to solve situations together

What Should Pupils be Reflecting On?

- Academic strengths and areas to develop
- Effort and challenge
- Motivation to develop self-efficacy
- Success towards goals and targets

A summary of Schon 1983 Reflection In Action and On Action



Donald Schön's 1983 work in *The Reflective Practitioner: How Professionals Think in Action* introduces two key concepts of reflective practice: "Reflection-in-Action" and "Reflection-on-Action."

Donald Schön explores how professionals engage in reflective practice to enhance their skills. He emphasises the importance of practitioners engaging in self-reflection to improve their professional practice. Schön argues that skilled professionals often make decisions through "reflection-in-action," where they think critically and adjust their actions in the moment (during a task), and "reflection-on-action," where they evaluate their experiences after the fact to learn and grow, which involves analysing past experiences to improve future practice. This process of continual reflection helps practitioners navigate complex, unpredictable situations and develop a deeper understanding of their work, moving beyond rigid, technical problem-solving methods. Schön argues that this reflective process is essential for navigating the uncertainty and complexity often encountered in real-world professional settings.

Schon, D. A. (1983) The Reflective Practitioner: How professionals think in action, Temple Smith.

Schon 1983 Reflection
In Action and On Action

EVIDENCE INFORMED

Schon suggests that adults reflect both in-action, during a task and after completing a task, which is on-action. At primary school level some pupils can do both naturally do this. However, some cannot. Reflecting in-action at the same time as completing could cause cognitive overload for some pupils.

We, therefore, need to be mindful of the cognitive load for all our pupils.

Will reflecting on their learning, whilst completing a task, lead to cognitive overload?

And what could we do if this is the case?

Schon, D. A. (1983) The Reflective Practitioner: How professionals think in action, Temple Smith.

Reflection on Action

The metacognitive cycle consists of planning, monitoring and evaluating. Reflection is an evaluative thought process, which can be structured or unstructured. It may be written down to document the process of reflecting on an experience or situation which has occurred. Reflection usually contains stages to review what went well, what didn't, and what could be changed to enable you to move forward.

Novice learners are unable to "see" that they are being successful at learning and are therefore more likely to give up. One way to show novice learners that they are being just as successful as more experienced learners is to use regular retrieval about how successful they have been during a lesson. With novice learners, it is better to begin with reflection on action rather than during the learning. As they develop expertise, they will be able to reflect during tasks as well.

We should be mindful of cognitive overload. When introducing a new topic or concept for any learner, it is better to start off with reflection on-action.

Pupils could be given a series of questions to reflect at the end of the lesson such as:
How did you get on with the task? Were you successful?
What was easy? What did you find challenging? What will you do next time?

EVIDENCE INFORMED

Mughal, A. (2022) Metacognition and Self-regulation in the Primary Classroom, Headteacher update.
Schon, D. A. (1983) The Reflective Practitioner: How professionals think in action, Temple Smith.

Final Thought:
What are the implications of this on classroom practice?

Adequate level of metacognition may compensate for students' cognitive limitations.

Veenman, M. V. J., Van Hout-Wolters, H. A. M. and Afflerbach, P. (2006) 'Metacognition and learning: conceptual and methodological considerations', Metacognition and Learning, 1 (1), pp. 3–14, as mentioned in Muijs, D. and Bokhove, C. (2020). Metacognition and Self Regulation: Evidence Review. London: Education Endowment Foundation.

Further information & resources

- *Akturk, O, A and Sahin, I (2011) Literature Review on Metacognition and its measurement, Ermenek Community College, Karmanoglu Mehmetby University, Karaman (2011) http://dx.doi.org/10.1016/j.sbspro.2011.04.364*
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- *Flavell, J.H. (1976) Metacognitive aspects of problem solving. In L.B. Resnick (ed.), The nature of intelligence (pp. 231-236).*
- *Flavell, J.H. (1979) Metacognition and cognitive monitoring: A new area of cognitive-developmental inquiry, American Psychologist (34).*
- *Kluger,A., and DeNisi, A (1996). The Effects of Feedback Interventions on Performance: A Historical Review, a Meta-Analysis, and a Preliminary Feedback Intervention Theory. Psychological Bulletin 1996, Vol. II9, No. 2, 254-284*
- *Mannion, J & Mercer, N. (2016) Learning to learn: Improving attainment, closing the gap at key stage 3, The Curriculum Journal (27,2).*
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