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What is metacognition and what does it look like in primary schools?

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In 2011, England's Education Endowment Foundation (EEF) first published the Teaching and Learning Toolkit, a kind of league table that allows you to compare a wide range of educational initiatives in terms of how much they cost, how secure the evidence is and how impactful they are (Higgins et al, 2011). At the top of this league table we find 'Metacognition and Self-regulation', which we are told provide 'very high impact for very low cost, based on extensive evidence'.

Naturally, this led to an increased interest in metacognition and self-regulation in schools. However, there is a lot of confusion within the teaching profession about what these words mean. Why are metacognition and self-regulation so often mentioned in the same breath? What is the difference between them, and how do they relate to one another? And most importantly of all: what do they look like in the classroom, and how can teachers harness the power of these ideas to improve outcomes for their pupils?

It is not surprising that there is confusion within the teaching profession about metacognition and self-regulation, because there is also a distinct lack of clarity among education researchers. In their review of the literature on metacognition, self-regulation and self-regulated learning, Dinsmore et al (2008) found that less than 50% of research articles offered a definition of these key terms. Moreover, where definitions were provided, there were frequently key differences as well as areas of overlap.

Metacognition, self-regulation and self-regulated learning: what's the difference?

In a recent article for the Chartered College of Teaching's Impact journal, I set out a framework for understanding

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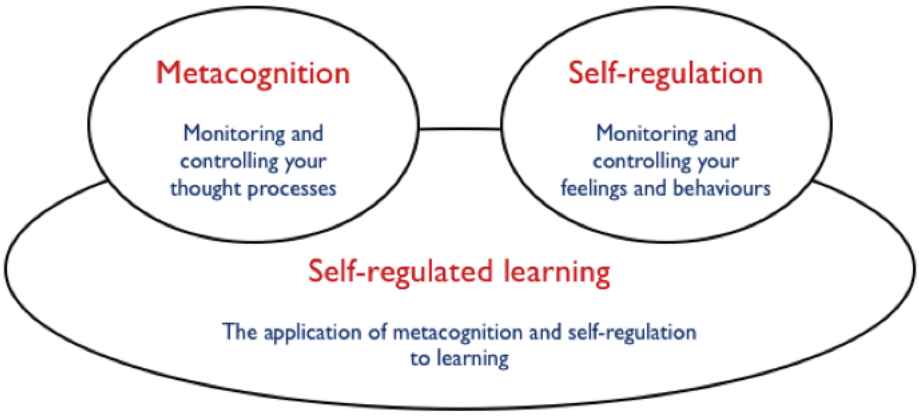
metacognition, self-regulation and self-regulated learning based on the original writing of key scholars in the field (metacognition: Flavell, 1979; self-regulation: Bandura, 1986; self-regulated learning: Zimmerman, 2002, Schunk, 2008; see Mannion, 2020). To summarise: metacognition is monitoring and controlling your thought processes; self-regulation is monitoring and controlling your feelings and behaviours; and self-regulated learning is the application of metacognition and self-regulation to learning (see Figure 1).

Figure 1. Metacognition, self-regulation and self-regulated learning



In this article, I will focus on how to promote metacognition in the primary classroom by teaching pupils how to monitor and control their thought processes. First, we will briefly consider why it is important to do so.

Why focus on self-regulated learning?

The EEF's claim that metacognition and self-regulation provide 'very high impact for very low cost, based on extensive evidence' is supported by several large-scale studies which consistently show that focusing on these ideas in schools – both at primary and secondary level – leads to significant improvements in pupil learning. A summary of the findings from five key studies can be found in Table 1.

Here we can see that these studies consistently found an effect size of around 0.5 to 0.7. To put this in context, any effect size above 0.4 is considered to be substantial, and Coe (2002) suggests that even a small effect size of 0.2 represents 'a difference that most schools would probably categorise as quite substantial.' To summarise the research: there is abundant, compelling evidence that focusing on metacognition and self-regulation leads to significant gains in pupil outcomes across a wide range of measures.

As well as improving academic outcomes, there is a strong moral case for teaching pupils how to become more confident, proactive, self-regulated learners. Helping young people learn to monitor and control their thoughts, feelings and behaviours is self-evidently a good idea. Focusing on metacognition, self-regulation and oracy in schools helps children find their voice, physically and metaphorically.

The ability to self-regulate is integral to helping young people develop knowledge of self, as well as knowledge of the curriculum. It promotes and prioritises their personal development as well as their academic learning, and prepares them for a life beyond the school gates where there is rarely, if ever, a teacher to tell you what to learn, how, and by when.

Table 1. Studies of programmes: a summary of effect sizes.

Focus of study	Average effect size
Metacognitive reading programmes (Chiu, 1998)	0.67
Self-regulated learning interventions (Dignath & Büttner, 2008)	0.61 (primary) 0.54 (secondary)
Strategies to improve self-regulated learning (Donker et al, 2014)	0.66
Self-regulated learning interventions (Dignath et al, 2008)	0.69
Thinking skills approaches (Higgins et al, 2005)	0.74

A simple way to help children learn to monitor and control their thought processes is to use think-alouds, a method whereby children are required to 'think out loud' as they complete a task.

How can we promote metacognition in primary schools?

There are many things schools can do to help young people learn how to monitor and control their thought processes (Mannion & McAllister, 2020). A central idea in learning to learn is to focus on the 'how' as well as the 'what' of learning. We need to find ways to make the invisible, implicit processes of learning visible, explicit – and therefore learnable. In this final section, I will share four examples of powerful classroom practices that do just this.

Think-alouds

A simple way to help children learn to monitor and control their thought processes is to use think-alouds, a method whereby children are required to 'think out loud' as they complete a task. Usually, the teacher models the process first, using a visualiser and narrating their thought processes as they solve a maths problem or read or write a complex text. Pupils can then follow suit, either in a low-tech way (e.g. in pairs with a pencil and paper) – or there are apps you can use (e.g. 'Explain Everything'). Think-alouds allow teachers to 'see inside' their pupils' minds, and they enable pupils learn to observe, emulate and internalise the processes of effective learning.

The weekly review

First, look back at the previous week (monitoring). What went well? What challenges did you encounter? What could you have done differently? Next, look to the week ahead (control): What's coming up? What are you looking forward to? What might you find difficult? What new strategies could you try? If you could live the last week again, what might you do differently? What would you do more/less of? What goals can we set ourselves for the coming week, to review next time? Pupils can discuss these questions and/or record them in a learning journal.

Questioning

Questions are perhaps the most powerful tool teachers have at their disposal, because they can be used flexibly and regularly, formally and informally, in writing or in conversation. Here are a few examples of the kinds of questions that can help young people learn to monitor and control their thought processes:

- Do you ever notice yourself thinking 'I can't do X', or 'I am rubbish at X'? What if we 'flip the script'? What if the opposite is true?
- Would you say you have a good memory or a poor memory? Why do you think this? Is your memory always the same, or is it different for different things? Why might this be?
- What tools or strategies help people organise their thinking when they are working on a difficult task? Have you ever tried any of these strategies? What did you notice?
- When you learned X today – what were you doing just beforehand? Were you listening, reading, asking a question? What behaviours help you learn effectively?
- If you think you can't do something, you're probably right. If you think you can do something – again you are probably correct. How can this be?
- When someone feels their thoughts racing, what can they do to slow down or control their thinking? Have you ever tried any of these strategies? What did you notice?
- Is it possible to force yourself to concentrate?

Mindfulness meditation/guided visualisations

If your aim is to help pupils learn to monitor and control their thought processes, there is perhaps no more powerful approach than mindfulness

meditation. Research suggests that mindfulness-based interventions can have a positive impact on psychological wellbeing, improving resilience, optimism, connectedness and happiness. Mindfulness is also associated with significant benefits for mental and physical health, emotional regulation, cognition and learning. Young children can find mindfulness meditation quite challenging at first, and so as a way in, it's a good idea to start with guided visualisations. There are many excellent scripts available on the internet. A good place to begin this journey is to read the freely available guidance document, Implementing Mindfulness in Schools: An Evidence-Based Guide (Weare & Bethune, 2021).

Conclusion

There is perhaps no more important aim for educators to focus on than to teach young people how to become more confident, proactive, self-regulated learners. However, I do not recommend that teachers or school leaders take ideas such as these off the peg and implement them in a top-down way. This approach is almost certainly destined to fail – not because they are bad ideas, but because top-down implementation is an ineffective way to bring about purposeful, lasting change. Instead, school-based practitioners should work together as a team to develop their own 'complex interventions', combining approaches that are suited to your particular school and your particular children, at this particular point in time.

The next Bulletin will be published in January 2022

Pen Portrait

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What does ASPE do for those in Primary Education?

We...

- promote informed and reflective study on practice that affects children's learning;
- encourage collaboration between colleagues in schools and universities;
- hold events which promote the best in researched practice;
- provide informed commentary on education policy issues;
- commission publications, including the international journal Education 3-13, written by leading researchers and practitioners.

References

Bandura, A. (1986) Social Foundations of Thought and Action: *A Social Cognitive Theory.* Englewood Cliffs, NJ: Prentice-Hall.

Chiu, C.W.T. (1998). *Synthesizing Metacognitive Interventions: What Training Characteristics Can Improve Reading Performance?* Paper presented at the Annual Meeting of the American Educational Research Association San Diego, CA, April 13-17, 1998.

Dignath, C., Büttner, G. (2008). Components of fostering self-regulated learning among students. A meta-analysis on intervention studies at primary and secondary school level. *Metacognition and Learning* 3, 231-264.

Coe, R. (2002) *It's the Effect Size, Stupid.* Paper presented at the annual conference of the British Educational Research Association, University of Exeter, September 12-14.

Dinsmore, D.L., Alexander, P.A. & Loughlin, S.M. (2008) Focusing the conceptual lens on metacognition, self-regulation, and self- regulated learning. E*ducational Psychology Review* 20(4): 391–409.

Donker, A. S., De Boer, H., Kostons, D., Dignath van Ewijk, C. C., & Van der Werf, M. P. C. (2014). Effectiveness of learning strategy instruction on academic performance: A meta-analysis. *Educational Research Review,* 11, 1- 26.

Dignath, C., Büttner, G., & Langfeldt, H.P. (2008). How can primary school students learn self-regulated strategies most effectively? A meta-analysis on self-regulation training programmes. *Educational Research Review,* 3 (2), 101-129.

Education Endowment Foundation (2011) Teaching and Learning Toolkit.

Higgins, S., Hall, E., Baumfield, V., & Moseley, D. (2005). A meta-analysis of the impact of the implementation of thinking skills approaches on pupils. In: *Research Evidence in Education Library.* EPPI-Centre, Social Science Research Unit, UCL Institute of Education.

Higgins, S., Kokotsaki, D., Coe, R. (2011). *Teaching and Learning Toolkit.* London: EEF.

Flavell, J.H. (1979) Metacognition and cognitive monitoring: A new area of cognitive- developmental inquiry. *American Psychologist* 34(10): 906–911.

Mannion, J. (2020) Metacognition, Self-regulation and Self-regulated Learning: What's the Difference? I*mpact, the Journal of the Chartered College of Teaching,* 8 (Spring), p66-69.

Mannion, J. (2018) Metacognition, self-regulation, oracy: *A mixed methods case study of a complex, whole-school Learning to Learn intervention.* PhD thesis, Hughes Hall, University of Cambridge.

Mannion, J. & McAllister, K. (2020) *Fear Is the Mind Killer: Why Learning to Learn Deserves Lesson Time - And How to Make It Work for Your Pupils.* Woodbridge: John Catt.

Schunk, D.H. (2008) Metacognition, self-regulation, and self-regulated learning: Research recommendations. *Educational Psychology Review* 20(4): 463–467.

Weare, K. & Bethune, A. (2021). *Implementing Mindfulness in Schools: An Evidence-Based Guide.* Sheffield: The Mindfulness Initiative. Available at: https://mindfulnessinschools.org/wp-content/uploads/2021/03/implementingmindfulnessinschools-vfinal-digital.pdf (Accessed September 24th, 2021)

Zimmerman, B.J. (2002) Becoming a self-regulated learner: An overview. *Theory into Practice* 41(2): 64–70.