WHAT IS META-COGNITION AND CAN WE TEACH IT? : JUNE 1, 2013

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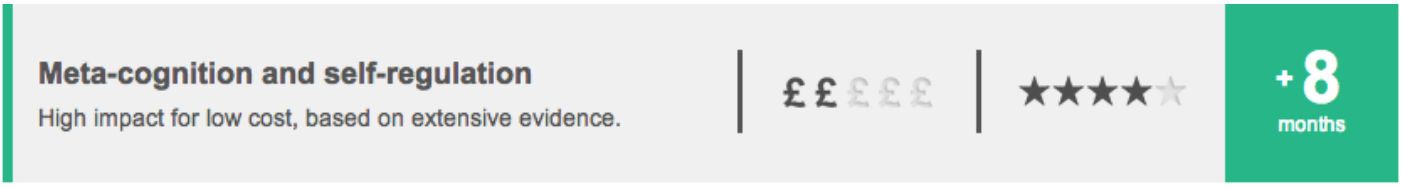
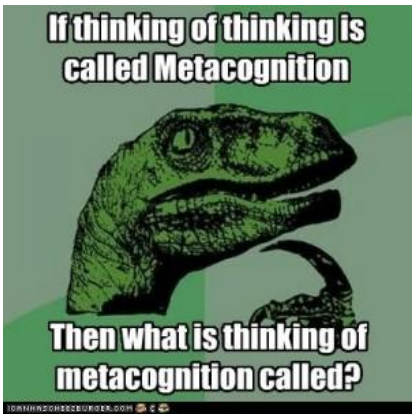
The Education Endowment Foundation cite meta-cognition and self regulation as the second highest impact strategy teachers can use in the class room.



It is described as follows:



Meta-cognitive and self-regulation strategies (sometimes known as 'learning to learn' strategies) are teaching approaches which make learners think about learning more explicitly. This is usually by teaching pupils specific strategies to set goals, monitor and evaluate their own learning. Self-regulation refers to managing one's own motivation towards learning as well as the more cognitive aspects of thinking and reasoning. Overall these strategies involve being aware of one's strengths and weaknesses as a learner, such as by developing self-assessment skills, and being able to set and monitor goals. They also include having a repertoire of strategies to choose from or switch to during learning activities.

They go on to say that "the potential impact of approaches which encourage learners to plan, monitor and evaluate their learning is very high."

But:

…it can be difficult to achieve these gains as this involves pupils in taking greater responsibility for their learning and in developing their understanding of what is involved in being successful. There is no simple strategy or trick for this. It is possible to support pupils' work too much, so that they do not learn to monitor and manage their own learning but come to rely on the prompts and support from the teacher. A useful metaphor is scaffolding in terms of removing the support and dismantling the scaffolding to check that learners are taking responsibility to manage their own learning.

Fair enough. They then suggest the following advice:

- Teaching approaches which encourage learners to plan, monitor and evaluate their learning have very high potential, but require careful implementation.
- Teach pupils explicit strategies to plan, to monitor and to evaluate their learning, and give them opportunities to use them with support and then independently.
- When using approaches for planning, ask pupils to identify the different ways that they could plan (general strategies) and about best approach for a particular task (specific technique).
- Monitoring involves identifying the key steps they need to be aware of as they go through a task to keep it on track. (Where might this go wrong? What will be the difficult parts?)
- Evaluating can be part of the process of checking so that it feeds into the current task as it nears completion (Can you make it better? Are you sure this is right?). It can also feed forward into future tasks (What have you learned that will change what you do next time?)

Now, learning to learn has had a bit of bad press recently, and is tarred by the SEAL and PLTS brush. My initial response to the above was to snort dismissively. As with most of us, I suffer with confirmation bias: what doesn't fit my views is conveniently ignored. Even when there seems to be loads of evidence to the contrary.

But the problem, as identified by cognitive psychologists like Daniel Willingham, is that we're shockingly bad at transferring knowledge learned in one context to another, without explicit instruction and advice. I've often lamented the fact that for a 'skills based' subject like English, students are appalling at transferring the skills learned, say, when analysing poetry to those needed when analysing non-fiction texts. It's straightforward in the mind of their teachers but for some reason they don't seem to intuit this. One answer, as we all know is to remind them. Again. And again. But, we won't always be there to remind them so where does this leave us?

Well, we can usefully think in terms of novices and experts. Novices and experts have different amounts of subject knowledge, but they also represent problems completely differently. A novice instantly sets about solving a particular problem as soon as it is set. This, inevitably, means concentrating at once on detail, which, equally inevitably, means ignoring structure. The novice immediately plunges into the wood and begins looking carefully and intently at and among trees. Not many trees can be seen at any one time and it is difficult to see any distance. There is a bewildering

amount of detail, but few clues as to the relevance of any of it. The light is poor in there, and no path seems any more hopeful than any other. Some turn out not even to be real paths. The sense of direction is soon lost. Under such circumstances, the novice can only plan small stratagems, which will take him a short way, and hope for the best. It is seldom absolutely clear whether any path is really relevant to the ultimate goal. It is often necessary to retrace steps and abandon particular paths. Sometimes it is difficult to tell whether a path has been tried before or not. It is inevitably largely a trial and error approach. Novices quickly forget most relevant details of the problem and lose the sense of the route taken to reach a solution.

While the novice is blundering speculatively back and to in the dark wood the expert has remained outside, thinking about problem structure, perhaps even walking away from the wood to some higher ground for a better overview. He will deliberately consider other woods he has been in, and the general and specific structures of problems they have posed. He will review his knowledge of woods in general and specifically. He will think about structure, but also about solution – what does he really want from addressing this particular wood and is it worth addressing? He may take time for a cup of tea and some peace of mind. He may look up information on his laptop which he foresees he will need. He will, in fact, deliberately employ meta-cognition. The expert may enter the wood in a while, but will then be concerned only with particularly meaningful trees, or patterns of trees, or topographical features, or alignment to the sun, or wind direction, or the tracks of particular animals … The expert will have seen whether it is worth working in this wood at all and, if so, what to look for, why and where. He will only be looking for, and at, particular features and he will know what they all mean for him. There will be few surprises in there.

An expert, however, understands the particular problem, but also the generalities of this kind of problem. An expert will recognise the probability that this wood is similar to other woods in important respects and the need to consider this deliberately before proceed swiftly, and directly, to their goal. Experts are much more likely to learn something that will be of value for next time a similar problem is encountered, particularly if any part of it has been tricky.

Working in that wood as a novice, however, is enervating, oppressive and a little frightening. Novices will have only have rather general impressions, and will notice and recall very few important details. Worse, little of what he recalls will make much sense and almost none of it will be memorable, or remembered. One major difference, therefore, between the novice and the expert, is that the one will soon run out of steam and become frustrated and even perhaps actually averse; the other will remain interested, especially if he feels he has been challenged. Novices risk demotivation the more difficulty they encounter, experts become ever more motivated by it.

Explicitly teaching students how to become overtly and consciously familiar with the methods they use to learn why they use them, how they work, why they work, when to apply them and how to apply them can help them think more like experts.

Understanding meta-cognition and the need for meta-cognition, is a major step towards what remains the goal of autonomous and confident competence rather the nebulous guff which masquerades under the term ‘independent learning’. We not only need meta-cognition as such, we also need to *know* that we need it – and we need to be to be told this. Again and again. We need to be told that there are broad principles and general approaches that structure and colour detail, and we need to be told that we must deliberately seek and consider these before we get bogged down in this detail. Experts do this. They may have expensive specialist knowledge but, every bit as importantly, they have also been trained to step back and meta-think rather than plunge straight in. As teachers, we become accomplished at finding the structures of our subjects and isolating the relevant; we learn to tell the difference between general understanding and the deliberate application of general understanding. But we’ve had to be trained to do this; it is no more ‘natural’, no more an innate skill, for us than it is our students. It doesn’t seem so very long ago that I was flailing in the classroom clueless about what I was supposed to be doing. All is, in other words, not lost.

Teaching meta-cognition, or any other meta-skill, demands the deliberate deployment of two venerable and unfashionable teaching methods; scaffolding and modelling.

Scaffold requires that we make explicit, and go on making explicit, the frameworks of meta-cognition and the need deliberately to build and then invoke them – the need to step backwards; to reach peace of mind; to engender confidence in one’s own abilities, experience and common sense and to deploy these; to take a deliberately wide, overall view; to invoke general theory; to consider related issues; to recall similar instances and compare them with present issues; to think generally about situational structure; to critique the present and particular presentation of issues; to consider an author’s putative purpose and read in the light of it and so on and so on. As these are not innate mental habits and do not transfer well into new situations, the need deliberately to engage in such general, proactive, critical and enquiring thinking about thinking must be made explicit repeatedly .

To model critical awareness when reading students need to see it in action. It must be made obvious that the teacher actually uses such meta-cognition in real life, that it is a genuinely useful, and used, set of techniques. Where a problem or issue is addressed the teacher must demonstrate her thinking aloud, must show how she uses meta-techniques herself when addressing issues or solving problems. Critical reading would be a perfect opportunity for such modelling. As a reading is approached and carried out we can actively model the meta-linguistic questions and ideas we keep actively running in our minds before and while reading. We can provide a commentary of our thinking. We can overtly show that we routinely interrogate text at the meta-linguistic level and are alert to agenda, immediate purpose and wider ambition.

It is a truism that the only person who makes no errors is the person who does nothing. It is also a truism that nothing can be achieved without action. To act is to risk, and inevitably fail. Error, though, is where learning begins. Error ought to be precious to us as a result.

Meta-knowledge is not innate, it must be taught. Part of meta-knowledge is the knowledge that we should seek and use meta-knowledge. This meta-awareness is apparently not natural. Embarrassingly, it has to be taught. Part of being meta-aware is the awareness of the value of meta-awareness itself and that its techniques should be deliberately recalled and applied.

We seek to produce students who choose appropriately among a selection of learning, self-correcting and self-management methods and the student who can take a strategic overview of their performance and attitudes towards their performance.

Here are some examples of the students I teach using meta-cognitive techniques they've learned:

- The student who taught me how to spell rhythm (Rhythm Helps Your Two Hips Move)
- Or the student who you find has looked up 'revolution' and found, to his interest, 'revolve' and 'revolutionary'.
- Or the student who turns up with three drafts of a piece of writing which get more focused and better written as they go. There are words written several different ways on the drafts, with the wrong spellings scored out. He has also retained the drafts without embarrassment.
- Or the student who muses, "What we really need to think about is what the guy who wrote this article is up to; where's he coming from?"
- Or the student who says "I wrote it this way because …"
- Or the student who, until recently always crouched protectively over his work, now pushes his writing over and asks, "Is that how you spell it?"
- Or the student who says, "Slow down sir! I can't take it all in. Give it to me bit by bit!"

These students are engaged in their own learning. They see it from outside as well as inside. They have the tools for tackling new situations and they have the understanding to look into their toolbox appropriately. They are drivers rather than passengers.

So can we teach meta-cognition? Yes, but it's not a subject! We need to find effective ways of scaffolding what we want students to learn and modelling the way we want them to apply this learning. If we get that right students' inability to transfer knowledge between domains might be minimised. Arguably, this what expert teachers do anyway. We just need to be more explicit about what we're doing and why we're doing it.