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Leading Learning: Learning How to Learn

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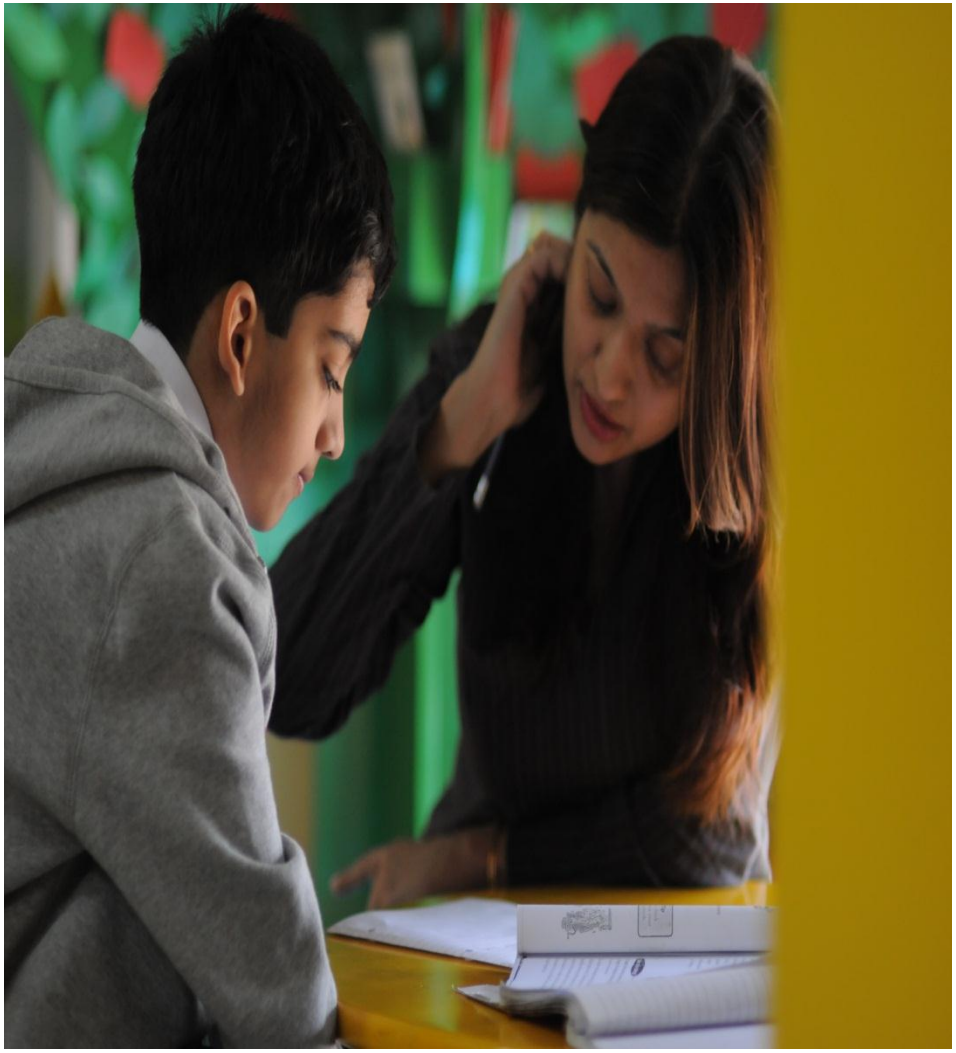
A DIVISION OF CAMBRIDGE ASSESSMENT

Overview of Presentation

- What is learning how to learn? [TS]
- Why does it matter? [TS]
- What are the implications for schools? [TS]
- What are the implications for teachers? [LD]



What is learning how to learn?

Cambridge learner and teacher attributes

Cambridge learners	Cambridge teachers
Confident in working with information and ideas – their own and those of others.	**Confident** in teaching their subject and engaging each student in learning.
Responsible for themselves, responsive to and respectful of others.	**Responsible** for themselves, responsive to and respectful of others.
Reflective as learners, developing their ability to learn.	**Reflective** as learners themselves, developing their practice.
Innovative and equipped for new and future challenges.	**Innovative** and equipped for new and future challenges.
Engaged intellectually and socially, ready to make a difference.	**Engaged** intellectually, professionally and socially, ready to make a difference.

What is learning how to learn?

Reflective learning: Learning how to learn

Source: Implementing the curriculum with Cambridge guide

Cambridge learners:

- constantly **monitor** what they are doing and produce **appropriate responses**
- **plan** and **manage** their work and performance and **evaluate** their progress
- **understand themselves** as learners and the nature of their knowledge
- apply their understanding to **performance**
- think **critically** and **creatively** to overcome barriers and engage with the subject
- are **emotionally resilient** when confronted with setbacks
- are **confident**, but not arrogant, in working with others and sharing ideas
- realise that learning is **social** and **collective**
- take **calculated risks**, understanding that we learn from mistakes.

What is learning to Learn?

Learning to learn means reflecting on one's learning and intentionally applying the results of one's reflection to further learning [Professor David Hargreaves / Chris Watkins]

Metacognition is a term used to describe the processes involved when learners plan, monitor, evaluate, and make changes to their own learning behaviours.

One Approach: [Chris Watkins]

- Making learning an object of attention
- Making learning an object of conversation
- Making learning an object of reflection
- **Making learning an object of learning**

working smarter not harder

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What is learning to learn?

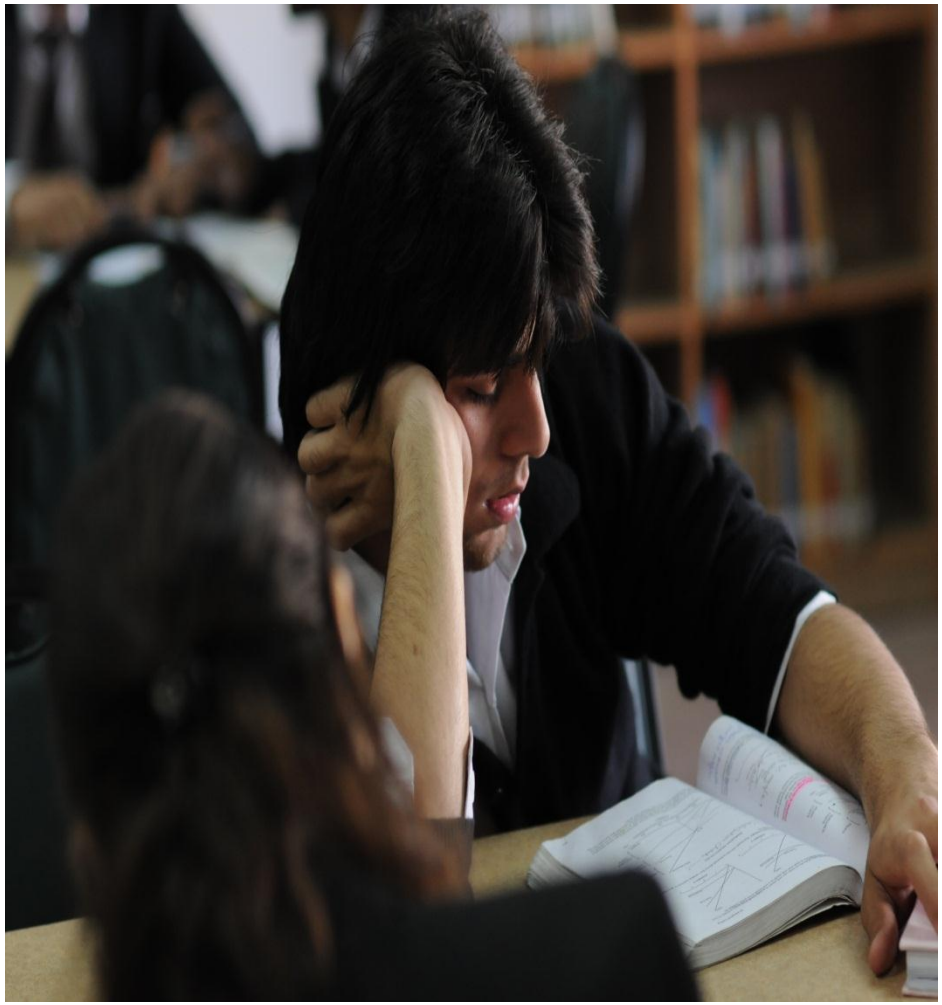
Learning happens when people have to think hard [C. Husbands IOE]

Learning to learn happens with students have to think hard about learning and understand themselves as learners

Learning involves a process of making meaning which is:

- incorporated into prior knowledge
- "… a significant change in capability or understanding"
- Deeper forms of learning modify previous understanding
- transfer to new situations

Adapted from the introduction to *Testing Times: the uses and abuses of assessment.* Gordon Stobart. Abingdon. Routledge. 2008

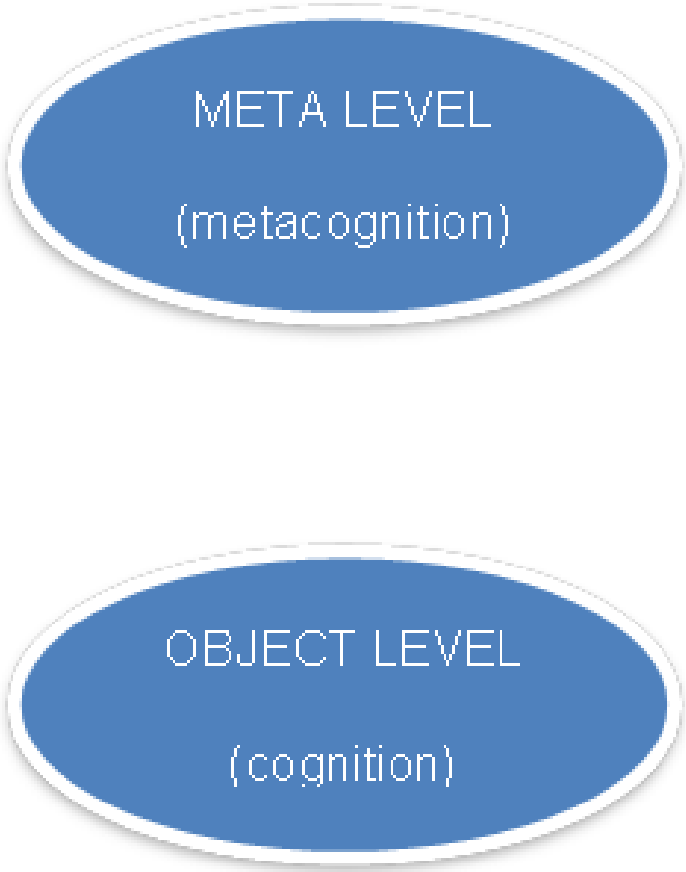


Active Learning

- Making learning and thinking visible
- Embedding formative assessment
- Strategies to support metacognitive development
- Approaches to developing Cambridge learner attributes

What is Learning to Learn?

Model of Metacognition



MONITORING
e.g., checking that you understand what you are reading

CONTROL
e.g., re-reading a paragraph; looking for hints or clues in the language

Nelson and Narens (1990)

What is Learning to Learn?

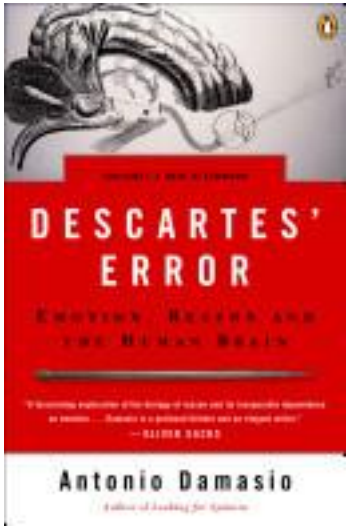
Metacognitive regulation

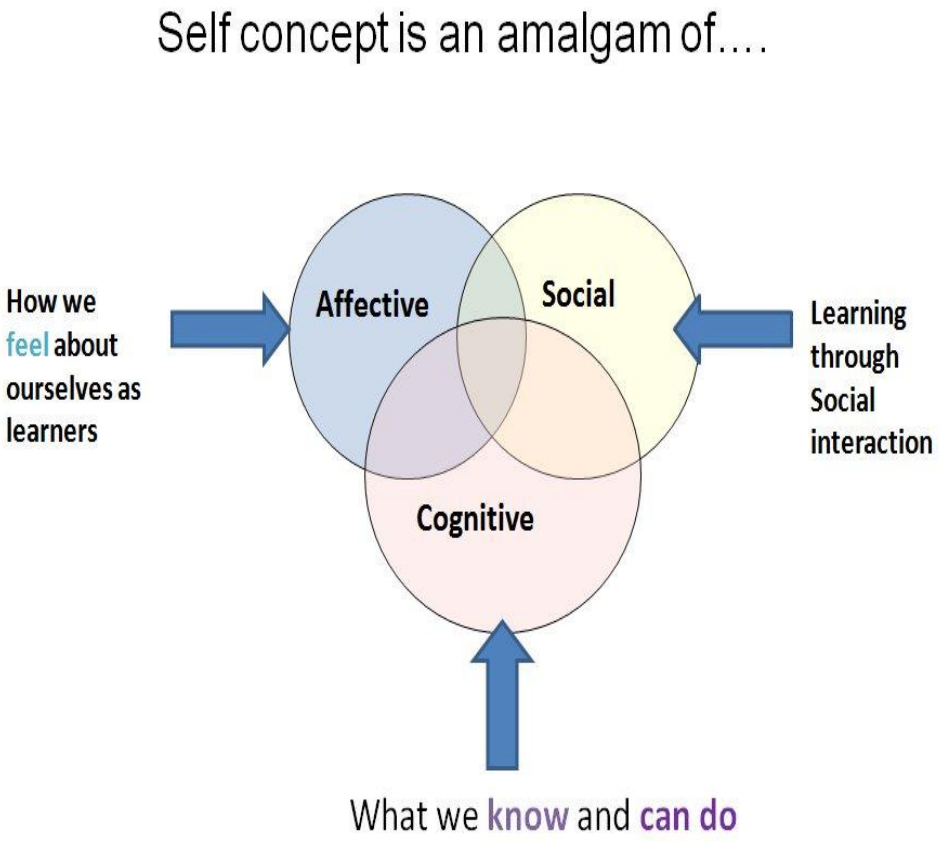
Metacognitive regulation describes how learners monitor and control their cognitive processes.

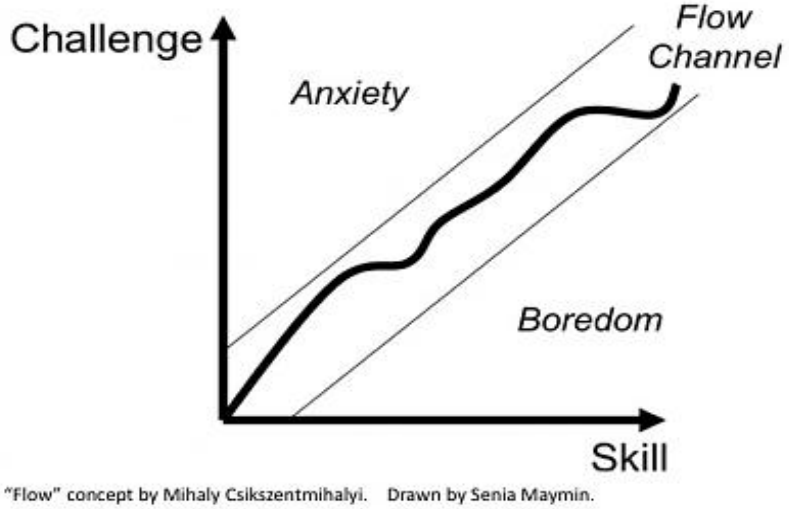
- Eg, a child realising the strategy they were using to solve a maths problem was not working and trying another approach.
- Eg, re-reading a poem several times, concentrating on ‘difficult’ words where necessary, for understanding.

What are the implications for schools? Importance of emotional competence

Antony Damasio – Feelings count: cognition is built on emotional platforms
Mihaly Csikszentmihayli – Flow



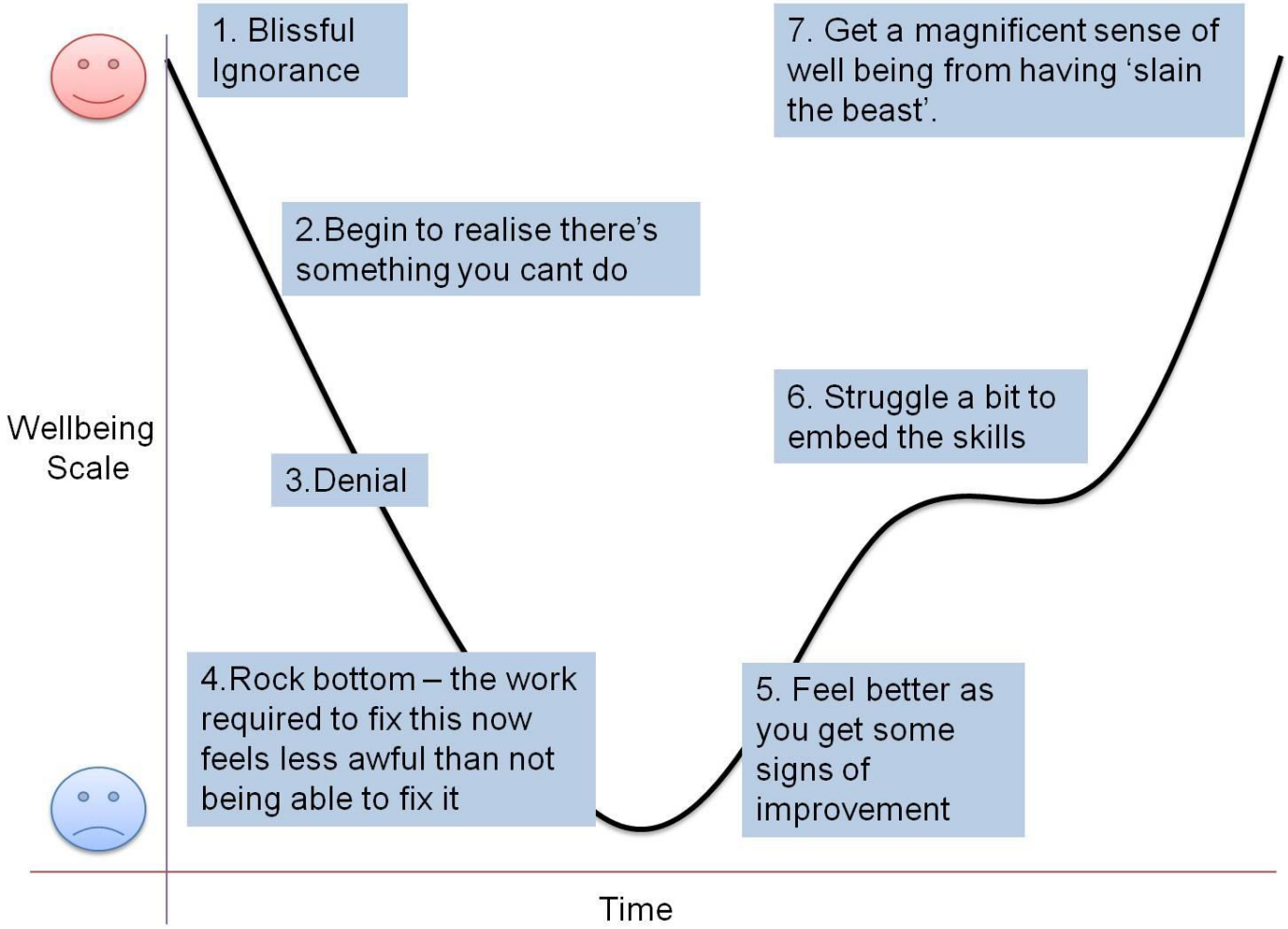




"Flow" concept by Mihaly Csikszentmihalyi. Drawn by Senia Maymin.

The importance of resilience: learning can be painful

[slide taken from a presentation by David Mansfield]



Why does it matter? Because it is powerful

David Whitebread
University of Cambridge

"Children's developing self-regulatory abilities predict academic outcomes and emotional well-being ***more powerfully than any other aspect of children's development,*** *including, for example, traditionally measured intelligence (Veenman & Spaans, 2005) and early reading achievement (McClelland et al, 2013). The crucial role played by these abilities has been extensively researched in relation to the development of an increasingly wide range of domains. These include:*

- *reasoning and problem-solving*
- *mathematics*
- *reading and text comprehension*
- *Writing"*

Veenman, M.V.J. & Spaans, M.A. (2005). Relation between intellectual and metacognitive skills: age and task differences. *Learning and Individual Differences*, *15*, 159-76.

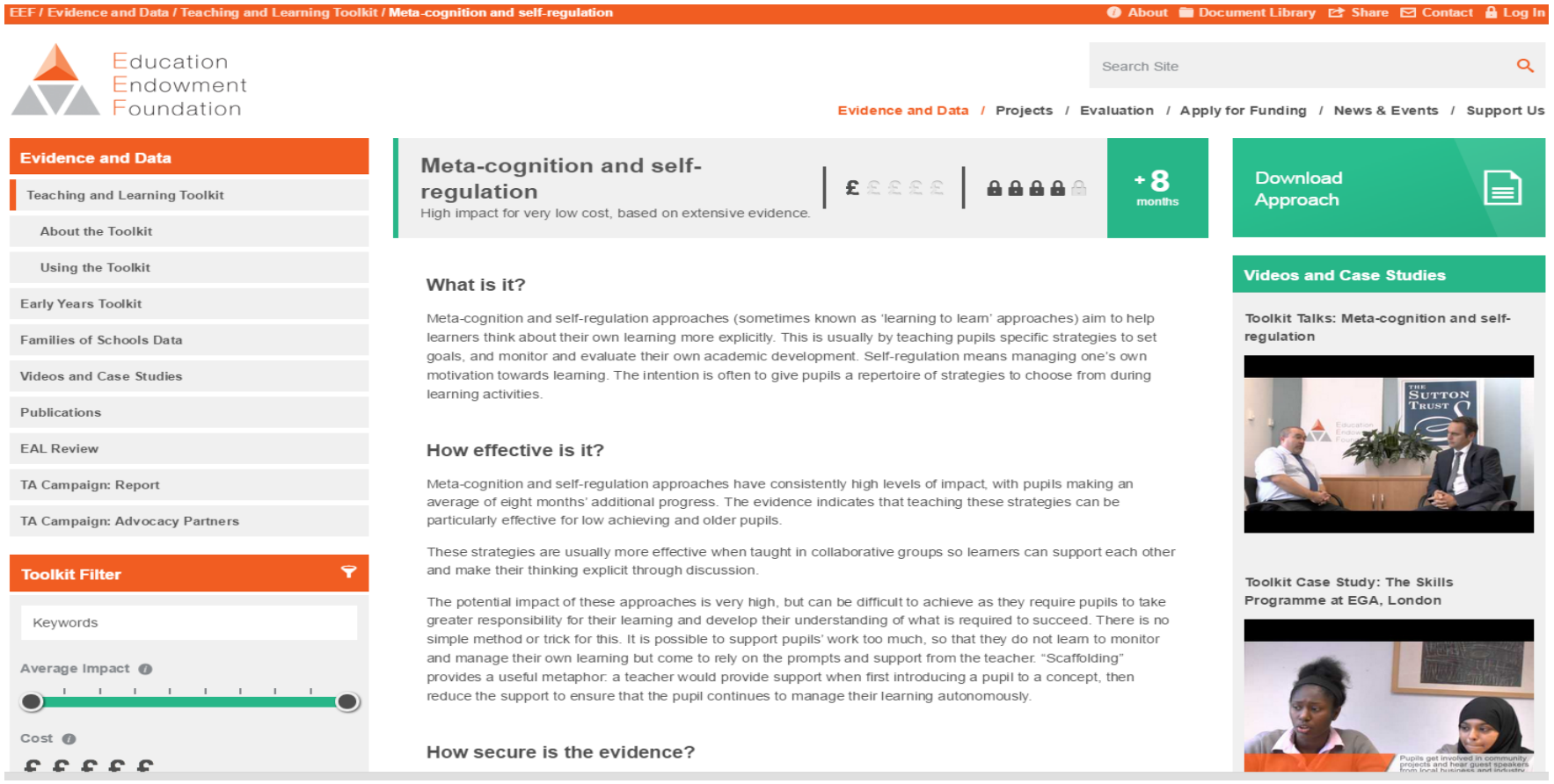
McClelland, M.M., Acock, A.C., Piccinin, A., Rhea, S.A. & Stallings, M.C. (2013). Relations between Preschool Attention Span-Persistence and Age 25 Educational Outcomes. *Early Childhood Research Quarterly 28*, 2, 314–24.

Why does it matter?

Because it is powerful

On average, introducing meta-cognition and self-regulation into the classroom has a high impact, with pupils making an average of eight months' additional progress.

https://educationendowmentfoundation.org.uk/evidence/teaching-learning-toolkit/meta-cognition-and-self-regulation/



What are the implications for schools?

Focus on a learning rather than a performance orientation

Source: Watkins, C. [2010] Learning Performance and Improvement. *Research Matters.* The London Centre for Leadership in Learning issue 34, summer 2010. www.ioe.ac.uk/insi

We need to challenge and change culture

From	To
Proving Competence	Improving Competence
Performance orientation	**Learning Orientation**
'Looking good'	'Learning Well'
	Making Learning an object of attention, conversation and reflection

"Students with more elaborated conceptions of learning perform better in public examinations."

"The evidence leads to the conclusion that learning about learning is a practically viable and educationally important strategy which also has the effect of improving performance."

What are the implications for schools?

- Effective habits of learning should be taught, nurtured and reinforced in all classes by all teachers.
- Many habits apply to both the formal and informal curriculum and need to be nurtured at home and around the school: punctuality, effort, resilience, collaboration…] *Cambridge learner attributes.*
- Critical thinking does not transfer easily from one context or subject to another. Teachers have to build bridges in students minds to help them make connections.
- Student self-evaluation reports, when well designed and supported, can be powerful.
- Some study skills can and should be taught explicitly and supported across the curriculum.

Study skills

Learning happens when people have to think hard so:

- Revision needs to be active [not passive] and soon after learning.
- Teachers and students need to review and reflect on important work covered repeatedly and regularly. *Coverage is the enemy of understanding* [H. Gardner].
- Attention given to big ideas and powerful concepts.
- Students need to challenge their thinking with questions [not copying notes].
- Reciprocal teaching and revision [Hattie effect size very large].
- Thinking routines can be useful methodologies for reflection and problem solving.
- Mistakes seen as learning opportunities and encouraged.
- Helping student organize and plan their work.
- Helping students understand how to structure written responses and present a reasoned argument.
- Correct referencing.

What are the implications for schools?

Offering creative curriculum options

Cambridge Global Perspectives

- An **interdisciplinary programme**, offered at Cambridge IGCSE®, Cambridge International AS Level and Cambridge Pre-U levels.
- Focuses on the nature of **argument and evidence**, encourages **understanding and respect** for the perspectives of others, and develops a range of skills for the **modern world**.
- Develops **flexible**, **reflective**, **creative** and **critical thinking**.
- Students learn how to **research** issues and arrive at well-reasoned and evidenced-based conclusions.
- Consider using Global Perspectives as the **curriculum core**.

Cambridge Enterprise

- Cambridge IGCSE Enterprise is a syllabus that brings the world of business into the classroom and gives learners a clear insight into **what it means to think like an entrepreneur**.
- This is the first Cambridge IGCSE syllabus which asks learners to adopt the thoughts and actions of entrepreneurs, developing their knowledge and understanding of the **practicalities of setting up and running their own new enterprise.**
- Cambridge IGCSE Enterprise equips learners with a **range of vital life skills for use in planning and organisation, communication and financial management.**

What are the implications for schools?

Making learning and thinking visible

"The biggest effects on pupils' achievement occur when teachers become learners about their own teaching, and when pupils become their own teachers." John Hattie

Through assessment for learning, the learner:

comes to hold a concept of performance similar to that held by the teacher

i.e. develops the notion of a standard

monitors the quality of his/her own performance

i.e. can compare own performance with the standard

- **sees how the quality of performance can be improved**

i.e. engages in the action that closes the gap between own performance and the standard

[adapted from Professor David Hargreaves]

What are the implications for schools?

A culture of learning

- A learning rather than a performance orientation.
- Student engagement [with learning, teachers, the school].
- Relationships with staff - mature, open and honest, collaborative, with mutual respect. ***Teachers model learning to learn.***
- Active participation – involvement in the design of teaching, learning, assessment, school life.
- **Social skills** - articulating point of view and presenting an argument, interpersonal skills.
- Intrapersonal skills: metacognitive awareness and regulation.

What are the implications for schools?

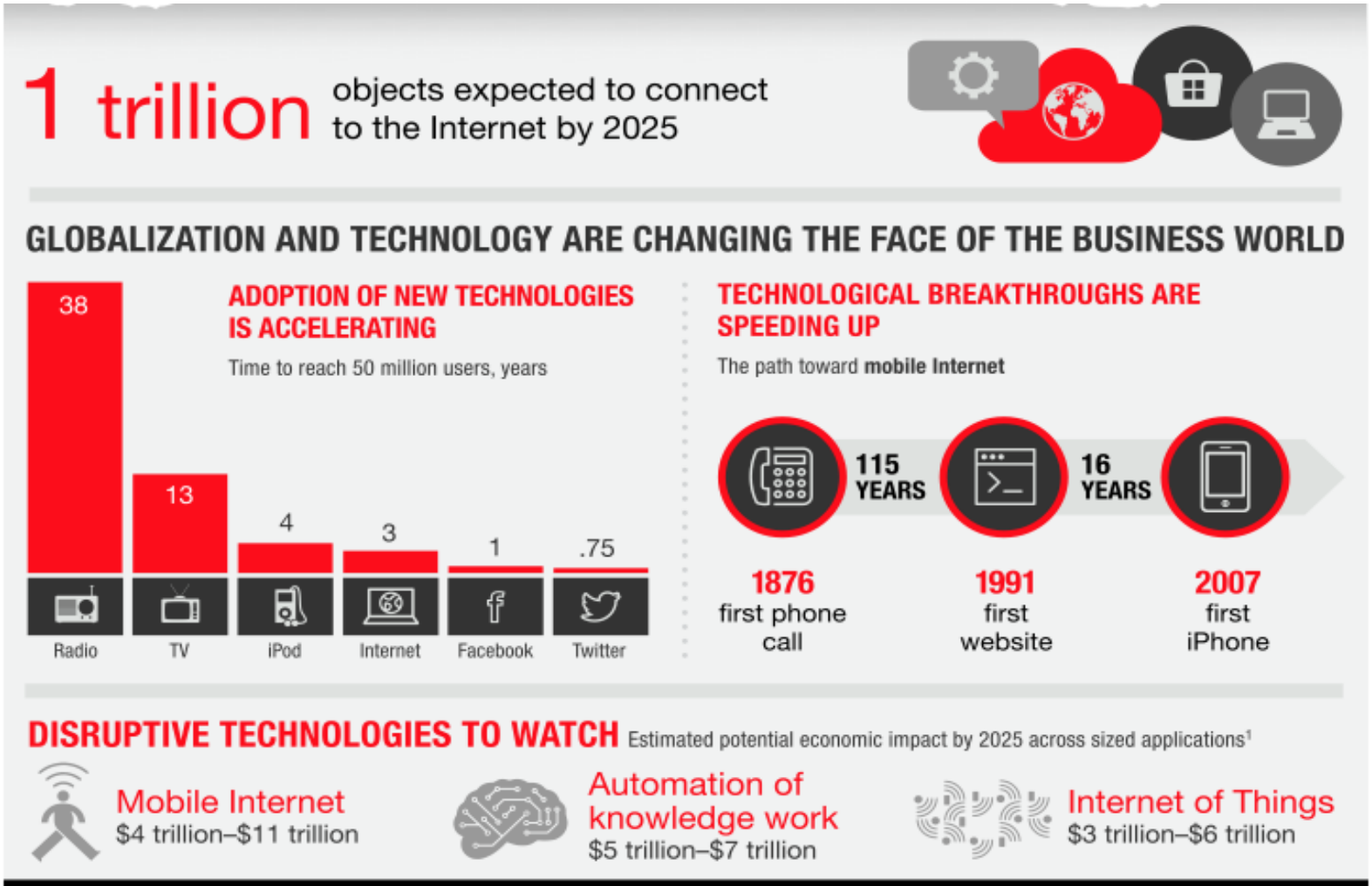
Offer a broad and balanced curriculum

- Broad and balanced. Students have to experience *a variety* of ways of thinking and doing.
- Looks at the connections between topic areas [within disciplines] and inter-disciplinary understanding] between disciplines.
- Concern with the informal and hidden curriculum.
- Extra-Curricula activities and responsibilities.
- Pastoral Care.
- Reporting [self-evaluation].
- Relationship with home and the broader community.
- Possibilities for student leadership and responsibility.

What are the implications for schools?

The critical importance of information literacy

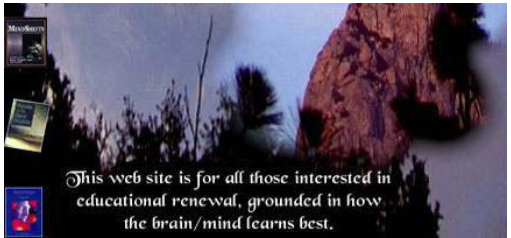
Accelerated Technological Change



What are the implications for schools?

Beware of neuro-myths

Left Brain Learning



Leaning styles (VAK) Visual, auditory, kinaesthetic
(Kratzig and Arbuthnott, 2006):

no benefit of having material presented in one's preferred learning style, concluding that attempts to focus on learning styles were "wasted effort"

does not detract from the general value for all learners when teachers present learning materials using a full range of forms and different media

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Student Leadership in the 21st Century:

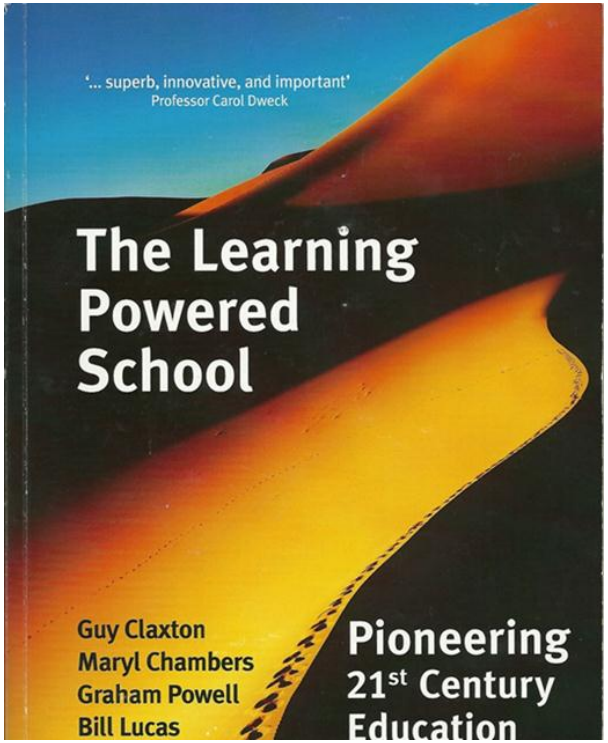
- Students have to be **leaders of learning** [their own and, through collaboration, others]
- Leadership starts with **'knowing yourself'** and developing self-confidence, empathy, communication skills, resilience and resourcefulness.
- It is about Virtue…making a positive difference
- It is an aspect of the curriculum that stresses **emotional *competence and maturity***, intra and inter-personal competence. Should be part of the curriculum
- Critical importance of **responsibility**
- **Quiet leadership**…often don't know the most effective leaders exist
- Critical importance of **challenge**

Kurt Hahn: ***Plus est en vous***

Benefits of Building Learning Power Guy Claxton

- Raised results
- better preparation for university / life
- More satisfying teaching

See also chriswatkins.net



Tuning in…

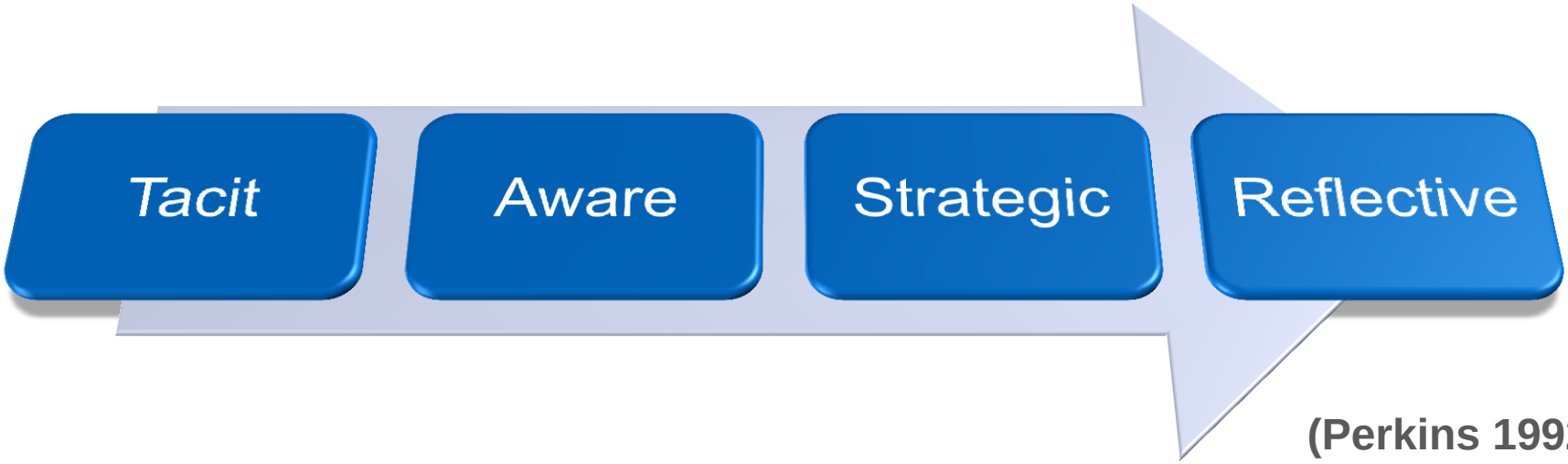
1. Read the following poem
2. Read for understanding
3. Explain the similes and metaphors contained in the poem to the person sitting next to you.

You're by Silvia Plath

Clownlike, happiest on your hands,
Feet to the stars, and moon-skulled,
Gilled like a fish. A common-sense
Thumbs-down on the dodo's mode.
Wrapped up in yourself like a spool,
Trawling your dark, as owls do.
Mute as a turnip from the Fourth
Of July to All Fools' Day,
O high-riser, my little loaf.

Vague as fog and looked for like mail.
Farther off than Australia.
Bent-backed Atlas, our traveled prawn.
Snug as a bud and at home
Like a sprat in a pickle jug.
A creel of eels, all ripples.
Jumpy as a Mexican bean.
Right, like a well-done sum.
A clean slate, with your own face on.

Four levels of metacognitive learners



(Perkins 1992)

“Happily, frogs were frolicking as I took a refreshing drink. Suddenly, I saw a splash of the pink piranhas. Elegantly, the River curved like a snake, the current as strong as an elephant. Violently, the river was crashing against the banks like a battering ram against an iron door. Peacefully, Trees were growing tall and healthy on the other side of the river. Smoothly, the water bounded on the smooth black rocks.”

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Metacognitive approaches typically involve:

- teaching students specific strategies to set goals, monitor, and evaluate their own learning progress.
- it involves **making learning goals explicit,** helping students to **plan strategies** and then ways of **monitoring their progress** towards achieving these goals.
- creating a learning environment that supports the development of metacognitive skills.
- encouraging discussion of strategies in class helps students understand when to use certain strategies, how they impact on their learning, and why the strategies work.

What does success look like?

Strategies

Strategy	Explanation	Example	Effect size
Organising and transforming	Overt or covert rearrangement of instructional materials	Making an outline before writing an essay; summarising and restating for others; 'found poem' activity.	0.85

Taken from Hattie (2009) Visible Learning

Calculating Effect Sizes

Definition

"The standardised mean difference between two groups."

$$\text{Effect Size} = \frac{[\text{Mean of Experimental Group}] - [\text{Mean of Control Group}]}{\text{Standard Deviation}}$$

An effect size of 1 equates to **12 months** of development for the learner.

"A change in practice whose effect size was known to be 0.6 would result in an improvement of about **one GCSE grade** for each pupil in each subject."

Why does it matter? Because it is powerful

Effect Sizes for teacher as activator and teacher as facilitator

Source: Hattie, J. [2009] Visible learning

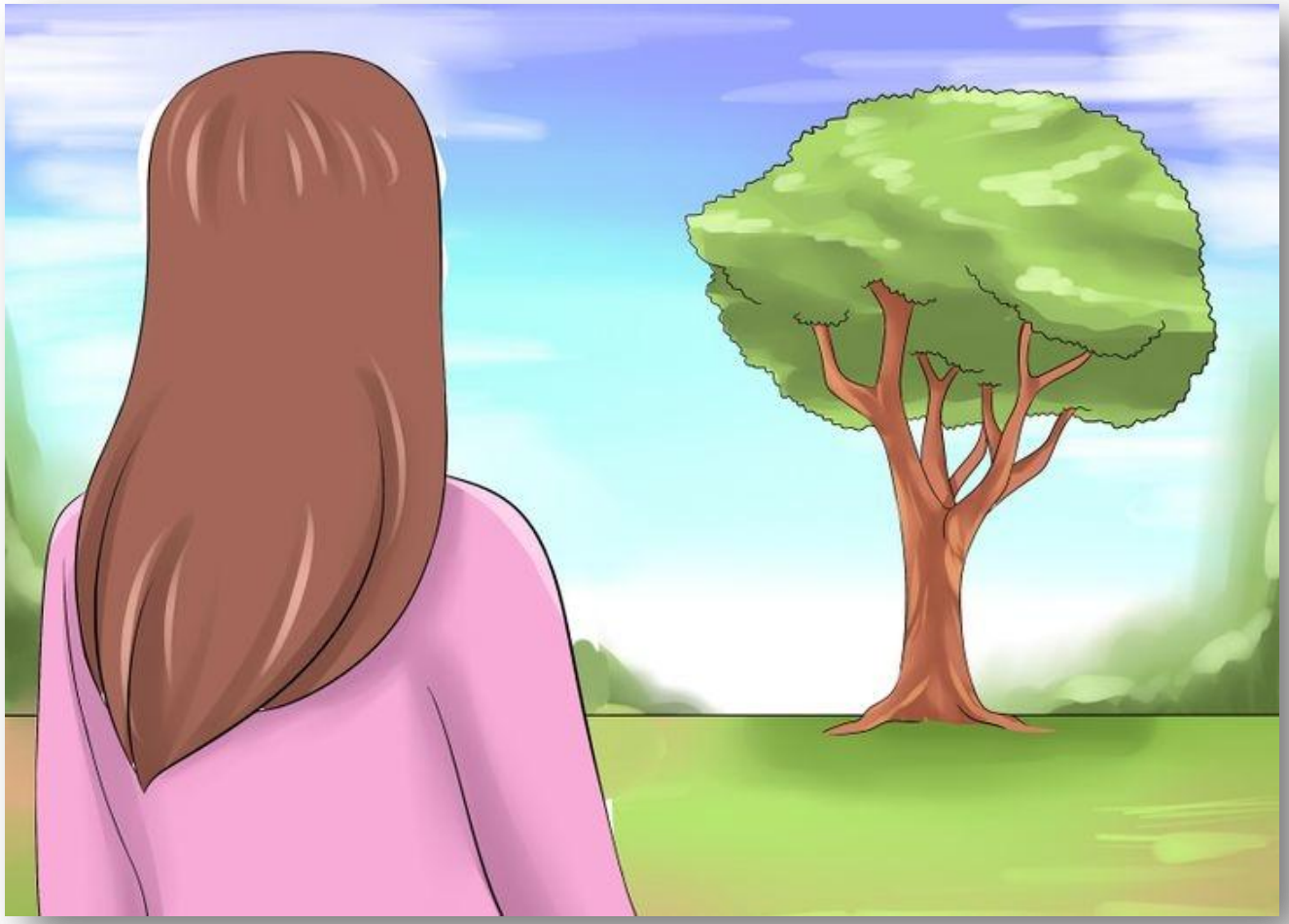
Teacher as Activator	Effect Size (d)	Teacher as Facilitator	Effect Size (d)
Reciprocal teaching	.74	Simulations and gaming	.32
Feedback	.72	Inquiry based teaching	.31
Teaching students self-verbalization	.67	Smaller class sizes	.21
Metacognition strategies	.67	Individualised instruction	.20
Direct instruction	.59	Problem-based learning	.15
Mastery learning	.57	Different teaching for boys and girls	.12
Challenging goals	.56	Web-based learning	.09
Frequent/effects of testing	.46	Whole language – reading	.06
Average activator	**.60**	**Average facilitator**	**0.17**

Strategies

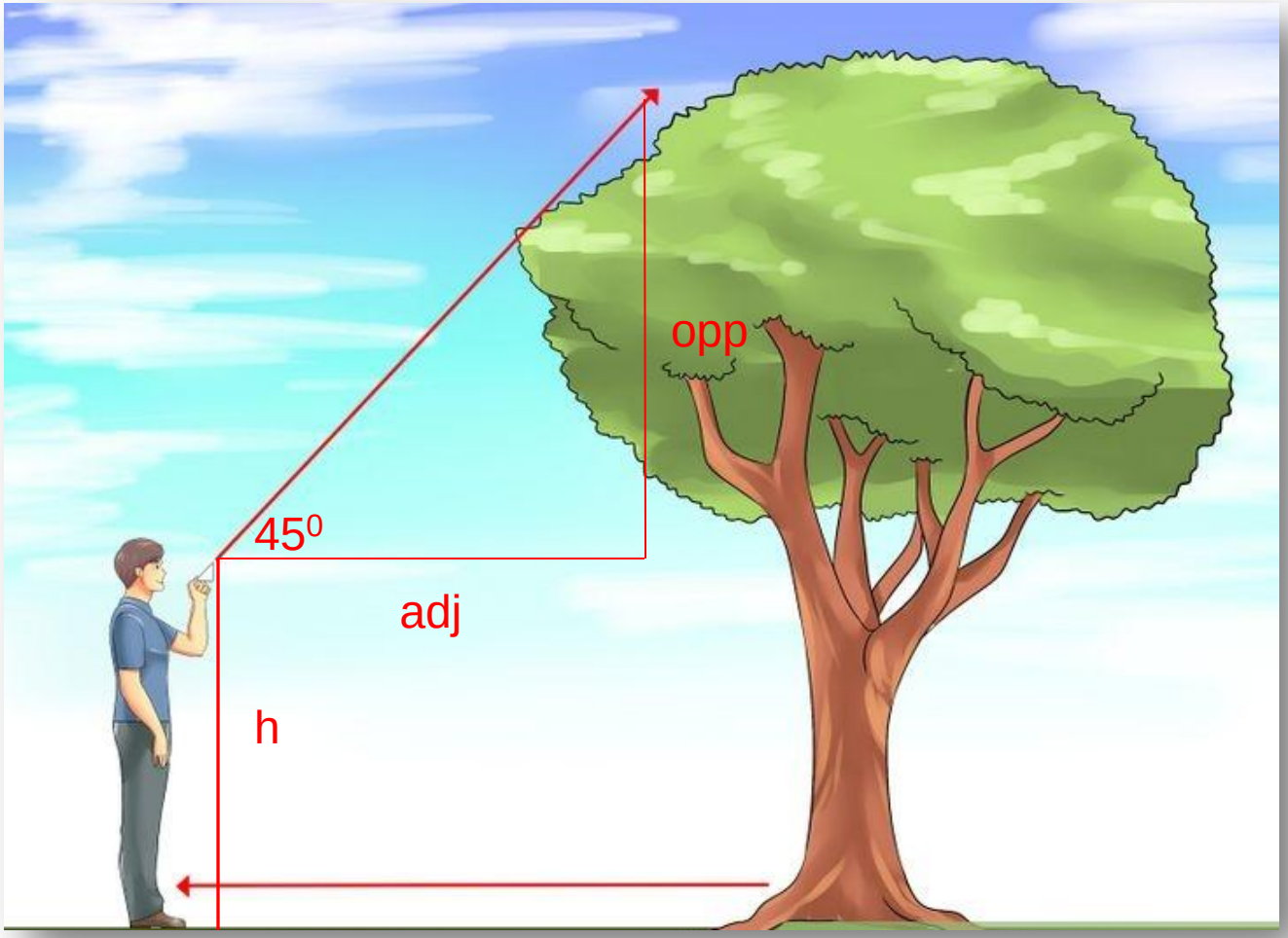
Strategy	Explanation	Example	Effect size
Self-instruction	Self-verbalising the steps to complete a given task	Verbalising steps in solving a maths problem	0.62

Taken from Hattie (2009) Visible Learning

How can you calculate the height of this tree?



Using trigonometry



Strategies

Strategy	Explanation	Example	Effect size
Self-evaluation	Setting standards and then using them for self-judgement	Checking work against rubric before handing in	0.62

Taken from Hattie (2009) Visible Learning


Metacognitive
Talk

9 Metacognitive Questions

- What questions could students ask themselves…
  - …before the task?
  - …during the task?
  - …after the task? (3 questions for each)

9 Metacognitive Questions

Before the Task

- Is this similar to a previous task?
- What do I want to achieve?
- What should I do first?

During the Task

- Am I on the right track?
- What can I do differently if I'm not?
- Who can I ask for help? C3B4Me?

After the Task

- What worked well?
- What could I have done better?
- Can I apply this to other situations?

(Taken from: innerdrive.co.uk)

Metacognitive Talk - teachers

What could you do if you have problems?

How do you know that?

We are learning how to solve problems. We are learning to analyse a poem.

Will this way make it easier?

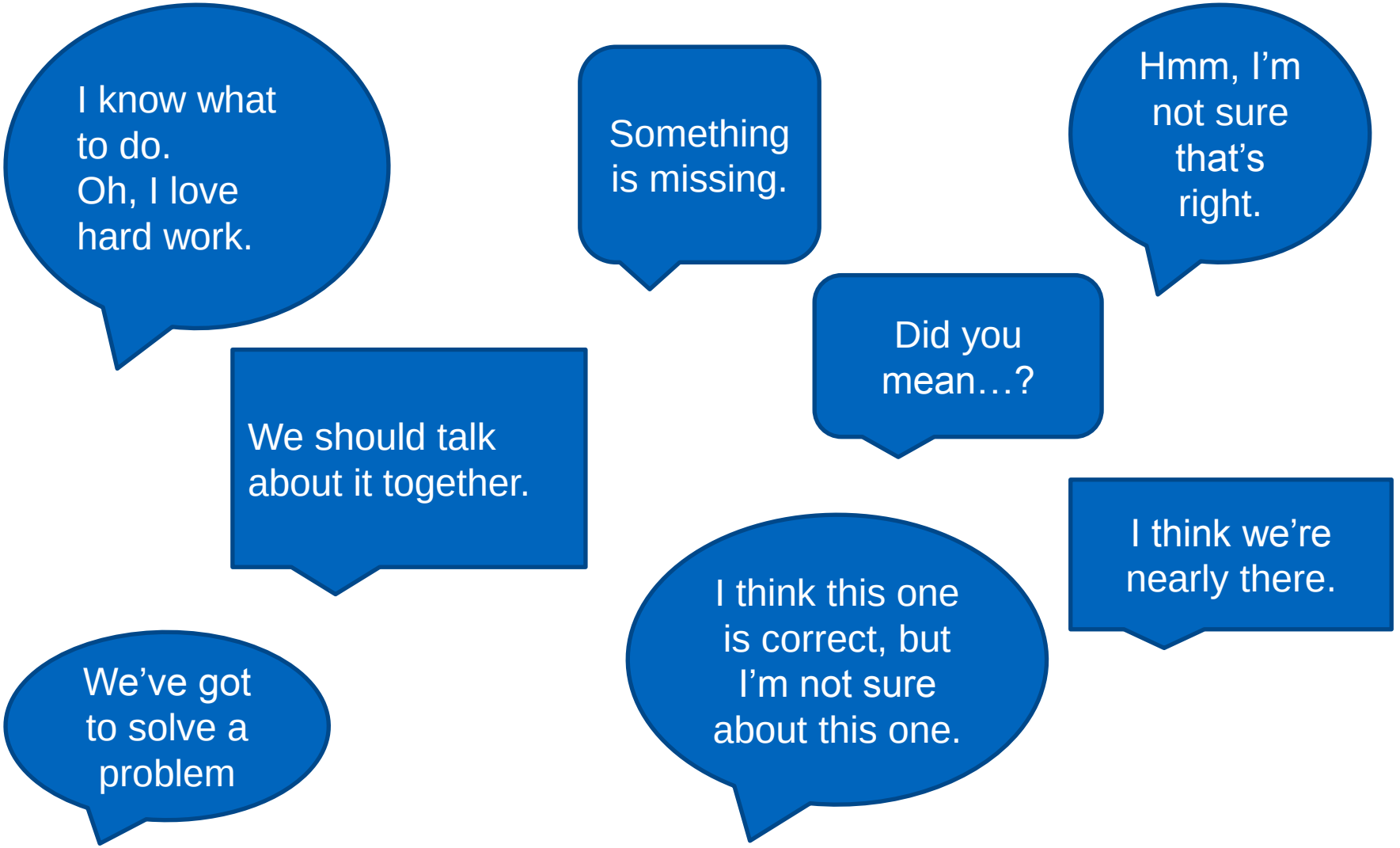
Was it difficult to do or was it easy?

Is there a better way?

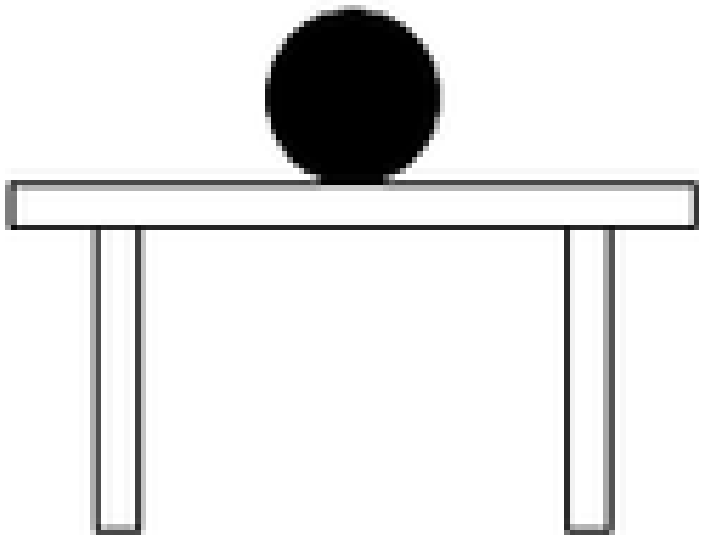
Check what you are counting in or the unit of measure.

I don't understand it either, so let's have a look together.

Metacognitive Talk - students



Metacognitive talk and formative assessment



The ball sitting on the table is not moving. It is not moving because:

A. No forces are pushing or pulling the ball.

B. Gravity pulls the ball down but the table is in the way.

C. The table pushes up with the same force that gravity pulls down.

D. Gravity is holding it on the table.

E. There is a force inside the ball holding it on the table.

Wilson and Draney, University of California, 2004

In which year did World War II begin?

A. 1937

B. 1938

C. 1939

D. 1940

E. 1941

Next steps – Cambridge Resources

Getting Started With Metacognition

http://cambridge-community.org.uk/professional-development/gswmeta/index.html

Education Brief – Metacognition

http://www.cie.org.uk/images/272307-metacognition.pdf

Want to know more?

Professor Steve Higgins from Durham University talking about what metacognition is and how it can be used in the classroom.

https://educationendowmentfoundation.org.uk/modals/video/132/

For a more in-depth look at metacognition, this podcast discusses the neural basis of metacognition, and how we measure and quantify it.

https://www.youtube.com/watch?v=PzdopL2mGqo

Want to know more?

Listen to Dylan Wiliam talk about the importance of young people being able to reflect on their learning and how teachers can utilise these insights

http://www.journeytoexcellence.org.uk/videos/expertspeakers/metacognitiondylanwiliam.asp

For more on the benefits of metacognition, visit the Education Endowment Foundation's Teaching and Learning Toolkit website which describes metacognition as having "high impact for very low cost, based on extensive evidence."

Explanation of effect sizes: https://educationendowmentfoundation.org.uk/uploads/pdf/Technical_Appendices_(July_2012).pdf

Want to know more?

Think Aloud:

https://www.teachervision.com/skill-builder/problem-solving/48546.html

SOLO and self-evaluation:

http://pamhook.com/mediawiki/images/d/dc/SOLO_Taxonomy,_Metacognition_and_HOT_Maps.pdf

Want to know more?

Websites

OECD Insights: Debate the issues. Focus on metacognition http://oecdinsights.org/2014/10/28/want-to-improve-your-problem-solving-skills-try-metacognition/

Examples of both cognitive and metacognitive questions that can be used in the classroom http://journal.media-culture.org.au/0605/11-leslie.php

Education Endowment Foundation: Teaching and Learning Toolkit on metacognition https://educationendowmentfoundation.org.uk/toolkit/toolkit-a-z/meta-cognitive-and-self-regulation-strategies/

Thinking Together Project. A dialogue-based approach to the development of children's thinking and learning. http://thinkingtogether.educ.cam.ac.uk

Chris Watkins, UCL Institute of Education. Numerous papers on learning to learn: http://chriswatkins.net/publications/

Want to know more?

Books

Hattie, J. (2009) Visible Learning: A Synthesis of Over 800 Meta-Analyses Relating to Achievement. Abingdon, UK: Routledge

Larkin, S. (2009). Metacognition in young children. London, UK: Routledge.

Whitebread, D. & Pino Pasternak, D. (2010) Metacognition, self-regulation & meta-knowing. In Littleton, K., Wood, C. & Kleine Staarman, J. (eds) International Handbook of Psychology in Education. Bingley, UK: Emerald.

Brown, A. L. (1987). Metacognition, executive control, self-regulation and other more mysterious mechanisms. In F. E. Weinert, & R. H. Kluwe (Eds.), Metacognition, motivation and understanding (pp. 65–116). Hillsdale, NJ: Erlbaum.

Kolencik P L and Hillwig S A (2011) Encouraging Metacognition – Supporting Learners Through Metacognitive Teaching Strategies. Peter Lang, New York.

"Too often, we teach students *what* to think but not *how* to think." - OECD Insights (2014)