METACOGNITION: BECOMING SPECTATORS OF OUR OWN THINKING

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In this session...

How do we define Meta-Cognition?

Why is it important to cultivate?

What are some instructional strategies to cultivate it?
Homo sapiens, sapiens

“a being that knows their knowing”
(or maybe it’s “knows they’re knowing”).
Research indicates that metacognition (Executive Function) is one of the most significant factors for supporting student achievement. However, studies suggest this is not being explicitly taught in most classrooms.

Brainsmart, 2016)
“Thinking is when your mouth stays shut and your head keeps talking to itself.”
DEFINING META-COGNITION

• Looking inside your own mind to see what’s going on in there.

• Paying attention to the pictures inside your head, the thoughts in your mind, the emotions you experience and even the feelings in your body.
DEFINING META-COGNITION

• Seeing into someone else’s mind and trying to see from their point of view.
IN SUMMARY: METACOGNITION IS PAYING ATTENTION TO OUR THINKING

✓ Being conscious of our own thinking, strategies and behaviors and their effects on others and the environment.
While all humans have the capacity, not all children or adults metacogitate. Metacognitive skills don’t come naturally; they must be consciously cultivated. Developing metacognitive capacities requires guidance by a skillful mediator.
If children gain better knowledge, understanding, and regulation of their own cognitive activities, it will improve their learning processes.

Understanding why and how they think in particular ways helps them learn better.
Like an internal compass, metacognition is the center of our "executive functions."
LET’S EXPLORE 4 EXECUTIVE FUNCTIONS

1. Attending to myself and others as learners
2. Selecting and managing appropriate cognitive strategies and when to become engaged in using them
3. Self regulating
4. Drawing knowledge into working memory
Of course I talk to myself.

Sometimes I need expert advice.
KNOWING YOURSELF AS A LEARNER

- Self-talk (Inner dialogue)
- Self-Questioning
- Inner-coaching
- Mental rehearsal
- Audiating (Inner humming; Ear-worm)
What do you know about yourself as a learner?

**Time:** (Am /Pm)

**Learning Style:**
(Synthesizer/analyzer, random/sequential)

**Sound:**
Noisy/Quiet

**Affinity:**
Solitude/Group

**Modality Preferences:**
(G.O.T.K.A.V.)
Why have normal smartphone notifications when you can use the smell of bacon?

Aromas include rose, mint, cinnamon roll, coffee, curry, jasmine, ylang-ylang, lavender, apple, coconut, strawberry and, corn soup. A special limited edition Korean BBQ
Cognitive Strategies: Mnemonics And Algorithms

Selecting, managing, and knowing when to use them
COGNITIVE STRATEGIES

PROBLEM SOLVING

Thinking Maps

- Brainstorming
Cognitive Strategies: Planning Ahead

Time, Materials, Resources, Energy, Location
Cognitive Strategies:
Comprehension and Task Performance

<table>
<thead>
<tr>
<th>What do I know, not know, want to know? (K_W_L)</th>
<th>What are my plans for finding out?</th>
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<td>What do I need to alter?</td>
<td>How well is my plan working?</td>
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<td>What puzzles me?</td>
<td>Where am I in my plan?</td>
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<td>What are my options if this doesn’t work?</td>
<td>Do I understand the criteria for success?</td>
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5 Instructional strategies
5 Instructional Strategies

- 1. Make Metacognition an explicit goal
- 2. Using and recognizing thinking words in your classroom language
- 3. Pose questions to engage cognition
- 4. Make thinking visible and auditory
- 5. Reflect on thinking processes
5 Instructional Strategies

• Make metacognition an explicit goal for discussion
“Today we’re going to think about how we think. I want you to become more mindful about what’s going on inside your head when you solve the problems. We will talk about what you observe your brain doing as you solve the problem.

You may write down, draw a graphic or talk with someone about the mental steps and strategies you are employing.”
What are some of the words that you associate with thinking?

Go to Mentimeter
LABELING THINKING SKILLS AND PROCESSES: E.g.

✴ “Let's look at these two pictures”

✴ “What do you think will happen when...?”

✴ “Let's work this problem.”

✴ “Let's COMPARE these two pictures.”

✴ “What do you PREDICT will happen when...?”

✴ “Let's ANALYZE this problem.”
LABELING THINKING SKILLS AND PROCESSES: E.g

✶ "How do you know that's true?"
✶ "How else could you use this...?"
✶ "Do you think that is the best alternative?"

✶ "What EVIDENCE do you have to support...?"
✶ "In what situations might you APPLY this...?"
✶ "As you EVALUATE these alternatives...."
LABELING THINKING
SKILLS AND PROCESSES: E.g

✴ “What do you think would happen if...”
✴ “What did you think of this story?”
✴ “How can you explain...?”

“What do you SPECULATE might happen if...”
“What CONCLUSIONS might you draw ...?
“How does your HYPOTHESIS explain...?”
Think of and write down a question that you asked or that you were asked in the past few days.

Be prepared to edit it.
3. Pose cognitive rather than behavioral questions to engage cognition.
Pose Cognitive Rather than Behavioral Questions to Engage Metacognition

**QUESTIONS THAT INVITE A BEHAVIORAL RESPONSE**

"Why did you do you that?"

"What did the author mean when......?"

"What are your plans for......?"

**QUESTIONS THAT INVITE A COGNITIVE RESPONSE**

"What where you thinking when you did that?"

"What clues in the story were you aware of?"

"What do you envision...?"
Pose cognitive rather than behavioral questions to engage cognition

**QUESTIONS THAT INVITE A BEHAVIORAL RESPONSE**

“**When will you start……?**”

“**Was that a good choice?**”

“**How did you solve that problem?**”

**QUESTIONS THAT INVITE A COGNITIVE RESPONSE**

“How will you decide when to start…..?”

“What criteria did you have in mind to make that choice?”

“What was going on inside your head as you were solving that problem?”
And remember... recognize and reinforce thinking rather than using praise

- “You persisted with the problem through to your conclusion.”
- “Your metaphorical thinking caused greater creativity!”

“You’re so smart!”

“You are very creative.”
Now return to the question that you wrote.

Edit to make it more cognitive and less behavioral.
Visible Thinking and Thinking Routines

5 Instructional Strategies: Display Thinking visually

- **METACOGNITION LOG**
  - What was the thinking skill you used in this lesson?
  - What questions or directions prompted you to engage in this thinking in the lesson?
  - How did you carry out this thinking? (What steps did you go through in your thinking as you did the lesson?)
  - Describe how this way of thinking compares with other ways you might have thought about the issues in the lesson. Which do you prefer and why?
  - If you use this thinking in another situation, how would you plan to do it? Pick a specific example and describe what you would think about in some detail.
5 Instructional Strategies: Invite Students to display their thinking verbally

4 Probe for thinking processes
Instructional Strategies inviting students to display their thinking: Talk Aloud Problem Solving

- "How do you know your answer is right?"
- "What other ways can you prove that you are correct?"
- "Explain what you mean when you said you 'just figured it out'."
- "When you said you started at the beginning, how did you know where to begin?"
- "So, your answer is (48). Who came up with a different answer?"
- "That's one possibility. Who solved it another way?"
- "Tell us what strategies you used to solve the problem"
- "What steps did you take in your solution?"
- "What was going on inside your head as you solved the problem?"
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ADD THIS COLUMN OF FIGURES
Probe for thinking processes

- "How do you know your are right?"
- "What other ways can you prove that you are correct?"
- "Explain what you mean when you said you 'just figured it out'."
- "When you said you started at the beginning, how did you know where to begin?"
- "That's one possibility.
- "Tell us what strategies you used to solve the problem"
- "What steps did you take in your solution?"
- "What was going on inside your head as you solved the problem?"
5. Reflect on your Thinking Processes

5 Instructional Strategies: Reflection
• As you reflect on this session, what ideas will you take away and use?
GO FORTH NOW AND THINK ABOUT YOUR THINKING!

META-COGNITION
Resources

- *Learning and Leading with Habits of Mind*, Costa and Kallick, ASCD, Alexandria, VA
- *Cultivating Habits of Mind*, Costa and Kallick, ASCD, Alexandria, VA
- 16 Instructional Animations [https://wondergrovelearn.net/videos](https://wondergrovelearn.net/videos)
• “I thank the Lord for the brain He put in my head. Occasionally, I love to just stand to one side and watch how it works.”

Richard Bolles