

## Session 2

# Metacognition and Creativity as Domains of Thinking

Metacognition develops  
self-regulated learners

Theoreticians are unanimous:  
"The most effective learners self-regulate  
their thinking and learning."  
(Butler & Winne, 1995, p. 245.)

"Research overwhelmingly suggests that  
learning is most effective when learners have  
some control over what and how they learn."  
(Zimmerman, 1994).

## Metacognition



Thinking about your own thinking  
is an essential element of  
effective thinking.

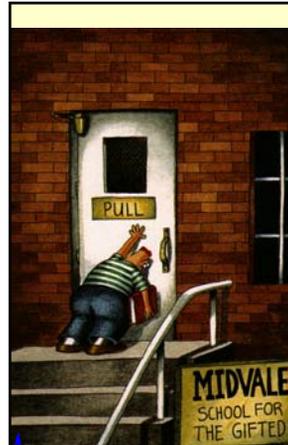
Know your knowing!

Being aware of your own  
thoughts, strategies, feelings  
and actions and their effects on  
others.

Stop and think about what you  
are doing

By thinking about our thinking  
we are able to:

- Select from a repertoire of strategies when we are faced with problems or new knowledge and experiences
- Monitor the successfulness of our selection and use of these strategies
- Modify and adapt our selection and use of strategies



processing

A simple question to illustrate  
metacognition.

## Think Aloud Problem Solving

Pose challenging problems then:

Invite students to describe their plans  
and strategies for solving the problem.

Share their thinking as they are  
implementing their plan.

Reflect on and evaluate the  
effectiveness of their strategy.



## TAPS

If the day before yesterday was Saturday,  
what would the day after tomorrow be?



## TAPS

There are 3 separate, equal-size boxes and inside each box there are 2 separate small boxes. Inside each of the small boxes, there are 4 even smaller boxes. How many boxes are there all together?



## Engaging and Sustaining Metacognition:

1. Pose questions that cause the student to check for accuracy?

- "How do you know you are right?"
- "What other ways can you prove that you are correct?"

2. Pause and clarify but don't interrupt

- "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?"

3. Provide data, not answers

- "I think you heard it wrong; let me repeat the question....."
- "You need to check your addition."

## Engaging and sustaining metacognition:

4. Resist making value judgments or agreeing with students' answers.

- "So, your answer is 48. Who came up with a different answer?"
- "That's one possibility. Who solved it another way?"

5. Stay focused on thinking processes

- "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?"

6. Encourage persistence

- "C'mon, you can do it!"

## Definition

Metacognition refers to the conscious application of an individual's thinking to their own thought processes with the specific intention of

understanding,  
monitoring,  
evaluating and  
regulating

those processes.



### What you think about ...

Objects of Metacognition	Objectives (reasons to metacognate)	Language
<b>Content</b> what you are thinking about	to monitor understanding of concepts or track progress in problem solving or formulating plans	Discipline
<b>Cognition</b> type of thinking being used	to achieve the objective of one's thinking and to sharpen thinking skills	List of types of thinking
<b>Conduct</b> personal behavior supporting thinking	to develop the habits of a successful thinker	Habits of Mind

	Understand	Monitor	Evaluate	Regulate
<b>Content</b>	Do I recognize that I am thinking about my thinking?	Am I able to check the reasonableness of my ideas and the progress of my thinking?	Do I understand well enough? Is the result correct and consistent with my other knowledge?	Can I now act on or use this knowledge? If not what need I do?
<b>Cognition</b>	Do I recognize the thinking skills I am using?	Am I using the right mix of thinking skills?	Am I using these skills effectively enough?	Did I use this skill well? Can I improve on my thinking the next time I use these skills?
<b>Conduct</b>	Do I recognize the behaviors that contribute to the success or failure of my thought and its consequences?	Am I using the right habits of mind? What other behavior should I bring to bear?	Am I using these habits well enough to achieve my objectives?	In future, when facing similar problems how should I behave?

### Stages of Metacognition

Being **AWARE** of the kind of thinking you are doing.

Knowing the **STRATEGY** you are using to do the thinking.

**REFLECTIVELY** evaluating the effectiveness of your thinking.

**PLANNING** how you will do the same kind of thinking the next time it is needed.

### Creativity as a domain of thinking

Encourage students to think creatively by:

- asking them open-ended questions,
- urge them to reflect on their own thinking,
- push them "up the Bloom" arrow,
- push them to ask their own questions.

In analyzing their problems:

- lead them to be aware of the dominant paradigm, routine versus adaptive thinking.

Be aware of individual's area of creativity