

# Fostering reflective and strategic learning in students with difficulties

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## What characterises struggling students?

### Cognition

- Forgets part of the instruction
- Is easily distracted
- Does not attend to salient inform.

### Motivation

- Gets up from his seat to drink, go to the bathroom
- Asks for help even before the end of the instruction

### Metacognition: planning

- Rushes on the task without forethought
- Does not organize the data

### Metacognition: monitoring

- Does not reread to better understand
- Does not adjust the procedure when facing a problem

### Metacognition: evaluation

- Does not check if the answer meets the task's demand
- Does not reflect if there was a better way to proceed

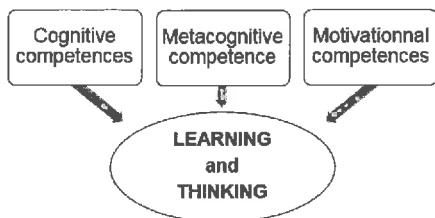
### Metacognition: strategies

- Does not use the reference tools
- Does not make a mental picture of the situation

## Successful learners = Self-regulated learners

Proficient learners are active, strategic, self-conscious, reflective, and motivationally driven:

➤ they regulate their cognition, metacognition and motivation



These competences are impaired in SEN students

## Metacognition

- **Planning:** defining goal, anticipating difficulties, defining steps, choosing strategies, estimating time and investment
- **Monitoring:** controlling state of knowledge, monitoring ongoing activities and progress, adapting plan and strategies
- **Evaluation:** final check, confidence judgment, reflection on strategies and efficacy
- **Metacognitive knowledge:** about the self, the task, the strategies
- **Strategies:** summarize, visualize, activate knowledge, external memory, ...

## Sharp your pencil and draw a helicopter

- What did you feel?
- How did you do?
- What strategies did you use?

5

## Some essential strategies

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**Activate prior knowledge:** What do I already know, What does it remind me?

- Access knowledge in long-term memory
- Transfer

I know there are different types of helicopters, for tourism, rescue, transport; I saw some in a documentary last week on the war in Syria; A friend explained to me why the number of blades can vary

6

**Describe and analyze:** What information is present, What do I see (what, how, why)?

- Encoding in working memory
- Mental representation
- Anticipate difficulties
- Spot salient information

A helicopter has a big rotor with 2 or 4 blades that are horizontal, and a small rotor at the back that is vertical.

7

**Planning:** What shall I do first, What are the steps?

- Planning comprises different actions:
  - Preparing and organizing needed material
  - Identifying the aim of the task
  - Anticipating possible difficulties
  - Defining the steps and their order
  - Setting strategies and procedures

I will not get it right the first time, so I will use a pencil and prepare an eraser; I will first draw the body, then add the rotor and other elements

8

**Make a mental image (visualization):** I see a picture in my mind, I make a movie in my head

- Mental representation
- Rendering things concrete, Exemplify

I see a helicopter in my mind

**Evaluation:** Does my production meet the demands, Did I do everything?

- Final check, rereading the instruction, comparing with expectations

Does my drawing look like a helicopter? Did she ask something else?

9

## Some other strategies

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- Explore all data
- Formulate and evaluate hypotheses
- Look for clues, salient information
- Look in details, Choose precise/discriminative elements
- Leave traces (external memory)
- Being systematic (exploration, search, control)
- Start with what is sure/known
- Ask oneself questions
- Summarize
- Paraphrase
- Organize information

10

## How to teach strategies

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- Metacognitive questioning
  - Questions asked before, during, and at the end of a task
  - Questions directed on **strategies** (not on the content or answers)
- Guided practice
  - Directly asking students to apply the strategies

11

- Modelling
    - Teacher explicitly demonstrates how to apply the strategy and explains how/why they help
  - Visual support
    - Posters, List of strategies with illustrations (personal or on the wall)
    - Or directly included in the instructions
  - Reflection and self-evaluation tools
- ⇒ Teaching strategies influences motivation (sense of being able, having tools, getting started)

12

## Metacognitive questioning and Guided practice

When you present a task:

- What do you already know? What does it remind you?
  - Activate prior knowledge
- What information is given to you? What are the different parts of the task (instruction, different questions, table, illustration, ...)? What is in the table? How is the figure made?
  - Describe and analyse

13

- What is the first thing you should do? How will you proceed? What will be the different steps, and in which order?
  - Planning
- Before starting, imagine the situation (word problem) in your mind. Make a movie in your head of the story you have read
  - Visualization
- Before handing your sheet over, ask yourself: does my production meet the demands, did I do everything?
  - Evaluation

14

## Modelling

Classe ces mots par ordre alphabétique

marionnette, imprudence, maire, maximum, mammifère, magazine, manière, impressionner, imprimerie, malhonnête, imprévu, improvisiste.

- *(Activate knowledge)*: "First I think of what I already know. It is about the order of the letters in the alphabet. I know a, b, c, .... It reminds me of the exercise we did yesterday when we had to look for words in the dictionary. The words are by alphabetical order in the dictionary".
- *(Describe-analyse)*: "There are no instructions, but only a title. Oh, the title says what to do. I see several words on two rows, they look alike, many start with the letter 'm', some with 'i'. There are lines, I guess for writing my answer".

15






Classe ces mots par ordre alphabétique

marionnette, imprudence, maire, maximum, mammifère, magazine, manière, impressionner, imprimerie, malhonnête, imprévu, improvisiste.

- *(Planning)*: "I think it's best to process one group of words after the other, so first the 'i', then the 'm'. Before starting, the first thing to do is to read slowly the words. That will help me to see the differences between them".

16

## Visual support

I think of what I already know.	
I describe and analyse.	
I decide what to do first. I make a plan.	
I make a picture in my mind.	
I check if I answered the question.	

Le petit constructeur



1. Je me souviens de ce que j'ai déjà fait.

2. Je décris et analyse.

3. Je décide ce que je fais d'abord.

4. Je fais une image dans ma tête.

5. Je vérifie si j'ai répondu à la question.

Je me souviens de ce que j'ai déjà fait.		<input checked="" type="checkbox"/>
Je décris et analyse.		<input type="checkbox"/>
Je décide ce que je fais d'abord.		<input type="checkbox"/>

17

- Strategy reminder directly in the instructions

### Classe ces mots par ordre alphabétique

Decide first how you will proceed !

marionnette, imprudence, maire, maximum, mammifère,  
magazine, manière, impressionner, imprimerie, malhonnête,  
imprévu, improvisé.

18

## Practice

- Choose one of the tasks according to the level you are interested in
- Imagine you want to teach the strategies to your students
  - Analyse: how can the strategies concretely be implemented in the task?
  - How will you proceed to teach the strategies? What will you tell your students?

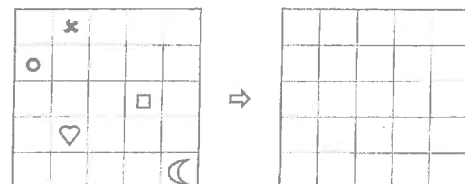
19

Activate knowledge, Describe-analyse, Planning, Mental image, Evaluation

Alan has 48 chicken. Usually they lay 48 eggs per day. But today Alan found 40 eggs, Tuesday and Wednesday he found as many eggs as there are chicken, Thursday 46, and Friday 40.

Alan still has 15 boxes of 6 compartments. Will he have enough boxes, or must he buy new ones. If yes, how many?

Draw the signs at the right place



20

## Teaching principles

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### Strategies must be explicitly taught

- Name them explicitly
- Explain how to apply them
- Explain their utility
- Make regularly reflection sessions: how did you do, what strategy did you apply? How did you apply the strategy? Why was it helpful?

### Strategy use must be practiced

- Give many opportunities and time
- Not to many strategies at the same time !

21

### Transfer must be trained

- Use different kind of tasks for practicing the same strategies

### Students should feel capable and become active

- Return questions:
  - What do you think? How would you do? What would you say? Try and tell me
- Give feedback oriented on strategies (and not only on performance)

22

**Thank you for your attention !**

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