

Topic: **Teaching Metacognition**

Issue: Students get frustrated because no matter how hard they try to understand and learn new information, they just aren't getting it. We have all seen a hard-working, motivated student become frustrated because the learning process is difficult and time consuming for them.

Today we are going to discuss what metacognition is, why it should be taught to your students, and how it can be taught to your students and then utilized for implementing personalized, effective, efficient learning strategies for individual students' learning needs.

What is metacognition? The knowledge people have about their own thought process. Understanding how you think. Awareness of one's own cognition.

Involves: -Planning and Goal Setting
-Evaluating thinking process and Monitoring progress
-Adapting as needed
-Connecting new information to former knowledge
-Selecting thinking strategies deliberately

Ann Brown (1980s) describes metacognition as *knowledge of cognition* and *regulation of cognition*.

Knowledge of cognition is what we know about our memory and thought processes.

- Declarative Knowledge: knowing what factors influence our learning.
- Procedural Knowledge: cognitive strategies like taking notes.
- Conditional Knowledge: knowing when or why to use a strategy.

Regulation of cognition is how we regulate our thinking strategies.

- Planning: selecting a strategy and allocating resources. Set goal, recall background knowledge, and budget time.
- Regulation: monitoring skills necessary for effective and efficient learning.
- Evaluation: appraising both self-regulation of processes and the products of their own learning.

Why should I teach metacognition? We learn strategies for managing our learning based on our awareness of how we learn.

Self-Regulated Learning

Expert Learners (Self-Regulated Learner)

- Sets learning goals
- Make a plan for learning
(consider time constraints & strengths/weaknesses)
- Monitor their own learning
- Satisfied with learning results or makes adjustments

Novice Learners

- Don't set learning goals
- Fail to plan
- Utilize only one learning strategy
- Disappointed with learning results

Problem-solving and research projects in any subject area provide opportunities for developing metacognitive strategies.

In this rapidly changing world, students need the skills to enable them to successfully cope with new situations. Good thinkers are successful problem-solvers and lifelong learners.

How do I put Metacognition into practice? How do I teach metacognition?

1. Teach students that strategies for learning improve over time with practice, implementation, and trial and error. (Learning skills are not innate)
2. Teach students to set learning goals and how to plan to meet those goals.
What do I want to learn/What do I need to learn? How will I learn it? What is my timeline?
3. Give students opportunities to self-monitoring and adapting.
Assign open projects in which students hold the responsibility for making their time line, learning goals, observing the assessment rubric, and for adjusting the learning strategies when needed.

-Six steps for implementing metacognition (Jr. & Sr. High students)

-Three areas of questioning for younger students
Self-questioning, summarizing, clarifying, and predicting throughout learning.

-Metacognition is late developing. Young students cannot describe their own cognition. They learn it is important to remember what they learn as they get older and become selective about what they will and will not try to remember.

-Teachers can prepare young students for metacognition by instructing them to estimate how difficult tasks are or how much time various tasks will take to complete.

Conclusion: When students think about *how* they think, they can figure out how they best learn and process information. The learning process becomes less frustrating and less time consuming.

References

Blakey, E., Spence, S. (no date). Developing Metacognition. *In education.com*. Retrieved 12/22/2012, from http://www.education.com/reference/article/Ref_Dev_Metacognition/?page=2.

Boulware-Gooden, R., Carreker, Thornhill, and Malatesha Joshi. (2011). Instruction of Metacognitive Strategies Enhances Reading Comprehension and Vocabulary Achievement of Third-Grade Students. *In Reading Rockets*. Retrieved 12/22/2011, from <http://www.readingrockets.org/article/21160/>.

Burning, R. (2011). *Cognitive Psychology and Instruction*. Boston: Pearson Education, Inc.

Fisher, R. (2007). Dialogic teaching: developing thinking and metacognition through philosophical discussion. *Early Child Development & Care*, 177(6/7), 615-631. doi:10.1080/03004430701378985

Joseph, N. (2010). Metacognition Needed: Teaching Middle and High School Students to Develop Strategic Learning Skills. *Preventing School Failure*, 54(2), 99-103.

Lovett, M. (2008). Teaching metacognition - Educause. *In Educause*. Retrieved 12/12/2012, from <http://net.educause.edu/ir/library/pdf/ELI08104.pdf>.

Undefined. (no date). What is Metacognition?. *In Benchmark Education*. Retrieved 12/22/2012, from <http://www.benchmarkeducation.com/educational-leader/reading/metacognitive-strategies.html>.

Priming for Metacognition

Planning

- I'm going to read a book about a nonfiction topic, and I really don't know much about it. I think I should read slowly. If I still don't understand, I may need to reread or skim the text.
- I wonder why...
- I already know something about this topic. It is...
- I know the word _____, but I don't know what _____ and _____ mean.
- I've seen this before when I went to...
- I see lots of graphics and charts. I'll need to use those to help me understand what I'm reading.
- Are there any clue words and phrases that might help figure out what text structure I'm reading?
- Before I continue reading, I need to stop and think about what I just read and make sure I understand it. If I don't, I need to stop and plan.

Monitoring

- The author gives me a picture in my mind when he describes...
- What might happen next? Why do I think that?
- What was this page about?
- Maybe I should reread this part again and look for specific information.
- How does the graphic on this page help me understand the text?
- Since I don't understand this word, I may need to...
- This wasn't what I expected. I expected _____ because _____.
- What can I write or draw that might help me remember and understand what I just read?

Evaluating

- How well did I read and understand?
- What strategies worked well for me?
- What strategies did not work for me?
- What should I do next time?
- Do I need some help for next time?
- How will I remember what I read?

Strategies for Developing Metacognitive Behaviors

1. **Identifying "what you know" and "what you don't know."** When presenting new information, students need to make conscious decisions about what they already know about and what they want to learn about. As students research the topic, they will verify, clarify and expand, or replace with more accurate information, each of their initial statements.
2. **Talking about thinking.** During planning and problem-solving situations, teachers should think aloud so that students can follow demonstrated thinking processes. Modeling and discussion develop the vocabulary students need for thinking and talking about their own thinking. Labeling thinking processes when students use them is also important for student recognition of thinking skills. Paired problem-solving is another useful strategy. One student talks through a problem, describing his thinking processes. His partner listens and asks questions to help clarify thinking. Similarly, in reciprocal teaching small groups of students take turns playing teacher, asking questions, and clarifying and summarizing the material being studied.
3. **Keeping a thinking journal.** A learning log aids students in reflecting upon their thinking, make note of their awareness of ambiguities and inconsistencies, and comment on how they have dealt with difficulties. A journal is a log of their process.
4. **Planning and self-regulation.** Students must assume increasing responsibility for planning and regulating their learning. It is difficult for learners to become self-directed when learning is planned and monitored by someone else. Students can be taught to make plans for learning activities including estimating time requirements, organizing materials, and scheduling procedures necessary to complete an activity. The resource center's flexibility and access to a variety of materials allows the student to do just this. Criteria for evaluation must be developed with students so they learn to think and ask questions of themselves as they proceed through a learning activity.
5. **Debriefing the thinking process.** Closure activities focus student discussion on thinking processes to develop awareness of strategies that can be applied to other learning situations. A three step method is useful. First, the teacher guides students to review the activity, gathering data on thinking processes and feelings. Then, the group classifies related ideas, identifying thinking strategies used. Finally, they evaluate their success, discarding inappropriate strategies, identifying those valuable for future use, and seeking promising alternative approaches.
6. **Self-Evaluation.** Guided self-evaluation experiences can be introduced through individual conferences and checklists focusing on thinking processes. Gradually self-evaluation will be applied more independently. As students recognize that learning activities in different disciplines are similar, they will begin to transfer learning strategies to new situations.

12th Grade Assignment:

- Read Edgar Allan Poe's assigned poem: *The Raven*, *A Dream Within A Dream*, or *The Bells*.
- Take photographs of places, objects, textures that 'look' like the poem.
- Using your photographs, create and draw a scene that illustrates the meaning, emotion, and setting of the poem utilizing previously learned knowledge of the Elements and Principles of Design.
- Work in assigned groups of four, combine your photographs, and create a 3-D model of the poem.

1. **Identifying "what you know" and "what you don't know."** When presenting new information, students need to make conscious decisions about what they already know about and what they want to learn about. As students research the topic, they will verify, clarify and expand, or replace with more accurate information, each of their initial statements.

How can students identify what they know and what they don't know or want to learn?

- As a class on the board.
- In a two-column chart in their journal/sketch book.
- Underlining the things in the directions that they know or are familiar with and by circling things they have questions about.

What questions should they ask themselves?

- What do I know about Edgar Allan Poe?
- Where could I take photographs?
- Do I need to review the Elements and Principles of Design?
- How could I implement the Element and Principles of Design to convey an emotion?
- Do I need help in interpreting a poem?

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How can the teacher talk about thinking for this assignment?

- Read the poems aloud to the class and model (on the board and verbally) how you break the poem apart to interpret it and/or understand it. (Strategy)
- Make a chart on the board as a class of the emotions the poem evokes and what Elements and Principles of Art could help convey those emotions.
- After reading and breaking down a poem as a class, have the students try it on a different poem in groups of four.

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What things could students write about in their journal for this assignment?

- What emotions the poems evoke?
- What do you interpret the poem to mean and log how this meaning evolves over the course of the assignment?
- Why do you interpret the poem to mean what you think it means?
- What Elements and Principles of Design they think would convey the emotions and setting of the poem and why/how?
- What was Poe feeling at the time he wrote this poem? Why do you think this?
- What strategies are used for breaking down and interpreting poems?
- Do I like poetry? Why? Is it difficult for me to understand? Why?

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How can students plan for this assignment and self-regulate their progress and learning process?

- By creating a timeline for their project. By planning deadline dates with their assigned groups.
- Constantly ask if the Elements and Principles of Design are conveying the message they want to relay to the viewers.
- Asking peers how they interpret their work and then make adjustments where needed.
- How did I read, interpret, and understand the poem before this lesson? How do I read, interpret, and understand the poem now? What strategies are now used?

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Considering what thinking strategies could have been used throughout the assignments, how can the teacher debrief after the assignment is completed?

- Leading a class discussion about:
 - Review the process for the assignments.
 - Parts of the process that did work and parts of the process that didn't work.
 - How did the photographs and object/texture collections help with the process of creating a drawing and diagram that conveyed the setting/emotion of the assigned poem?
 - How did you come to understand the poem?
 - How could you collect data for other projects?
 - How did the feelings the poem evoked effect or influence your work or how you think about experiences in your own life?
 - What thinking strategies were used? Charts, lists, diagrams, collaging...
 - What are some alternative approaches that could have been used?

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How can students self-evaluate their assignment throughout the process?

- By constantly asking themselves if the Elements and Principles of Design are conveying the essence of the poem.
- By asking peers to critique their work and then make needed adjustments.
- By returning to the poem, re-reading it, discovering alternative meanings/interpretations.

How can students use/apply the learning strategies from this assignment in other classes or on other assignments?

- When trying to think of ideas for projects, look around. Take photographs or collect objects that will inspire you or help you define your thoughts.
- Work collaboratively to problem solve.
- Utilize previously learned information.
- Define what you already know and what you need/want to learn.