

College & Career Readiness ...Life Skill description:
meta-cognitive-usage-03112017

How do we get students to utilize meta-cognitive skills in their learning environment?

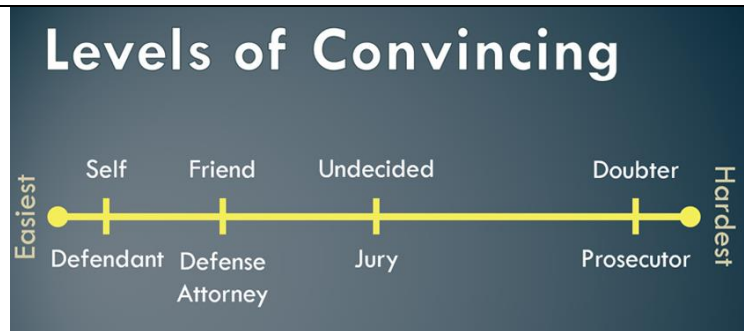
Definition:	Metacognition is the process of thinking about thinking. It is the process of developing self-awareness and the ability to self-assess. It is contemplation about one's education and learning -- past, present, and future. Since adults are largely self-determining, helping them develop metacognitive skills is an essential element in any program intended to increase their autonomy.
Culture of the word	Awareness and understanding of one's own thought processes.
Reference:	
Source:	Source: http://www.umbc.edu/alrc/standards.html
Video:	https://youtu.be/mVE21QhY-II
Capacity:	Thinking does not occur spontaneously but must be evoked by problems and questions or by some perplexity; confusion or doubt ... John Dewey
Additional information	<p>The diagram illustrates the Reflection Cycle as a continuous loop of three stages: before planning, during doing, and after reflecting. The cycle is connected by arrows, with the top arrow labeled "Capture the Moment", the bottom arrow labeled "What?", the left arrow labeled "Now What?", and the right arrow labeled "So What?". The central text reads "Reflection Cycle" and "Metacognition: Change over Time".</p>

Need to create metaphor that the students can use to relate the meta-cognitive skills they need to use to learn from their actions.



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- Build a house
- Sports game ... Squash
- Crossing the street



Example Crossing the street

Crossing the street	Meta-cognitive action
Making a decision	Planning
Looking both ways	Monitoring
Start crossing	Doing
Look again	Monitoring
Recognize that you crossed	Planning
What did you learn	Reflexing

Similar to explaining in a trial


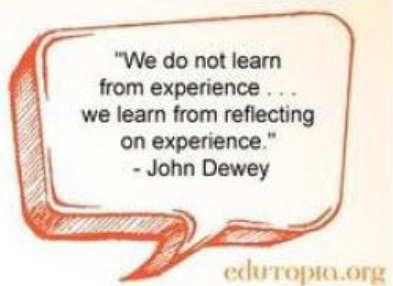

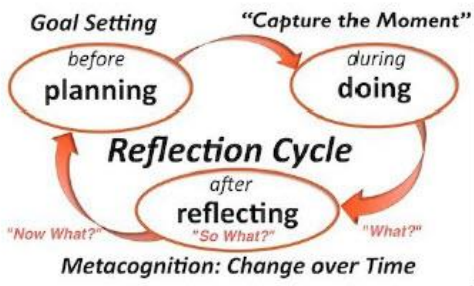
What happens in Meta-cognition?

- Capture what you are learning
- Reflexing on it. *What's happening*

<p>Self Directed Learning and Reflecting</p>	<p>Review: What is Self Directed Learning? How does my Peers think about this? Can I learn from them?</p> <p>The diagram shows two models of learning. On the left, 'Teacher Directed' shows a single red figure at the top with four arrows pointing down to four black figures. On the right, 'Learner Directed' shows five black figures arranged in a circle with a red figure in the center. Green double-headed arrows connect each black figure to its neighbors in the circle, and also connect each black figure to the central red figure.</p>
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<p>Review: Tracking your Progress</p> 	<p>Reflecting During Self Directed Learning</p>
<p>Tracking Progress and Reflecting</p>	<p>Benefits of Reflecting</p> 
<p>Some Guiding Reflection Questions</p>	<p>What score did I achieve?</p>
<p>What learning strategies did I use?</p> <p>Example Learning Strategies</p> 	<p>Review</p> <p>In review...</p> 
<p>Examples of metacognitive activities include planning how to approach a learning task, using appropriate skills and strategies to solve a problem, monitoring one’s own comprehension of text, self-assessing and self-correcting in response to the self-assessment, evaluating progress toward the completion of a task, and becoming aware of distracting stimuli.</p>	
<p>Constructing understanding requires both cognitive and metacognitive elements. Learners “construct knowledge” using cognitive strategies, and they guide, regulate, and evaluate their learning using metacognitive strategies. It is through this “thinking about thinking,” this</p>	



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use of metacognitive strategies, that real learning occurs. As students become more skilled at using metacognitive strategies, they gain confidence and become more independent as learners.

Individuals with well-developed metacognitive skills can think through a problem or approach a learning task, select appropriate strategies, and make decisions about a course of action to resolve the problem or successfully perform the task. They often think about their own thinking processes, taking time to think about and learn from mistakes or inaccuracies (North Central Regional Educational Laboratory, 1995). Some instructional programs encourage students to engage in “metacognitive conversations” with themselves so that they can “talk” with themselves about their learning, the challenges they encounter, and the ways in which they can self-correct and continue learning.

Fogarty (1994) suggests that Metacognition is a process that spans three distinct phases, and that, to be successful thinkers, students must do the following:

- Develop a **plan** before approaching a learning task, such as reading for comprehension or solving a math problem.
- **Monitor** their understanding; use “fix-up” strategies when meaning breaks down.
- **Evaluate** their thinking after completing the task.

Instructors can model the application of questions, and they can prompt learners to ask themselves questions during each phase. They can incorporate into lesson plans opportunities for learners to practice using these questions during learning tasks, as illustrated in the following examples:

During the planning phase, learners can ask, *What am I supposed to learn? What prior knowledge will help me with this task? What should I do first? What should I look for in this reading? How much time do I have to complete this? In what direction do I want my thinking to take me?*

During the monitoring phase, learners can ask, *How am I doing? Am I on the right track? How should I proceed? What information is important to remember? Should I move in a different direction? Should I adjust the pace because of the difficulty? What can I do if I do not understand?*

During the evaluation phase, learners can ask, *How well did I do? What did I learn? Did I get the results I expected? What could I have done differently? Can I apply this way of thinking to other problems or situations? Is there anything I don't understand—any gaps in my knowledge? Do I need to go back through the task to fill in any gaps in understanding? How might I apply this line of thinking to other problems?*



College & Career Readiness ...Life Skill description:
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Meta-cognitive / Reflection skills

Problem Solving	Cognition
Planning <ul style="list-style-type: none"> • Orient • Planning 	<ul style="list-style-type: none"> • Identify relevant information – Problem framing • List major outcomes (Requirements)
Doing <ul style="list-style-type: none"> • Execute action plan • Monitor outcome 	<ul style="list-style-type: none"> • Search the Library • Notice inconsistency, confusion • Re-check
Self-Reflection <ul style="list-style-type: none"> • Make a conclusion • Evaluate outcome 	<ul style="list-style-type: none"> • Check evidence with requirements • Justify our hypothesis based on evidence • What have we learned? • What can we improve going forward

This section outlines some of the metacognitive skills that are essential for lifelong learning. Its purpose is to guide instructors in incorporating activities and discussions that will help learners understand how they learn, their strengths and their needs, and to better understand the learning process.

The metacognitive skills are presented as a list without reference to level of language skills. Like technology skills, learners' metacognitive abilities are rarely aligned exactly with their language skills levels. The ability to understand and analyze one's own learning is especially influenced by



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educational background and previous experience.

The arena of metacognition presents a special challenge to instructors at the lowest levels, where learners have higher-order thinking skills in place but lack the communication skills to relay them. It may also be difficult to convey some of the more abstract or complex ideas like goals, strengths, and learning styles without translation. Instructors at the lowest levels often use visual representations of simplified concepts and translation. It's important to note, too, that some of the concepts in this section may be decidedly "foreign" to learners in ESL/ESOL classes. For example, the concepts of goal setting and evaluating one's class (i.e., "evaluating the teacher") may be unfamiliar to learners, and they may actually be very uncomfortable providing meaningful critiques. Learners may not feel it appropriate to share "personal" thoughts and reflective insights. Therefore, teaching and incorporating metacognitive skill development is an ongoing process.

Learners will set *Learning Goals*

- Understand "goals" and illustrate and/or describe their own personal goals for participation in English classes.
- Set goals related to working, parenting, and/or participating in their community.
- Differentiate between long and short-term goals.
- Outline activities that will help them achieve their goals.
- Identify obstacles to meeting their goals.
- Identify community resources and sources of support for meeting their goals.



College & Career Readiness ...Life Skill description:

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- Develop and practice skills necessary to achieving their personal goals. (i.e. problem-solving skills).
- Report any progress toward meeting their goals (e.g., received driver's license, etc.).
- Review and update learning goals throughout the program.
- Revise course of action for meeting goals.
- Identify and develop new strategies to achieve learning goals.
- Explore additional educational opportunities.
- Plan a career path and develop a resume appropriate for use in the U.S.

Learners will understand their own *Learning Styles*

- Identify their previous learning experiences.
- Express likes and dislikes about learning activities.
- Understand “strengths” and “weaknesses.”
- Recognize learning modalities/preferences in simple terms (e.g., see, hear, feel, do).
- Self-assess (using instructor-provided tool) learning styles and preferences, strengths and weaknesses
- Share and explain their own learning preferences and learning strategies to others.
- Describe how one's learning preference affects how one learns.
- Recognize learning modalities/preferences in more complex terms (e.g., visual, auditory, oral, kinesthetic).



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Identify learning styles in terms of preferred way to take in information (concretely or abstractly) and in terms of preferred way to process information (through observation/reflection or through experience/action).

Learners will *Evaluate their own Learning*

- Express feelings about class in simple terms: I like...
- Illustrate/describe progress toward their goals.
- Monitor and assess their progress (with, and later without, instructor guidance).
- Provide feedback to instructor about needs/preferences.
- Identify achieved goals.
- Determine next steps/changes to plans and activities.
- Report new needs (goals) as they arise.
- Demonstrate an understanding of evaluations and surveys (e.g., on-the-job, in school, customer service, etc.).
- Seek additional/supplemental learning opportunities.
- Learn independently of group activities/instructor input.

Meta-Cognition/ Reflection One area that has been much researched is that of problem solving (Fisher 1987). As Miller and his colleagues (1960) point out 'an ordinary person almost never approaches a problem systematically and exhaustively unless specifically educated to do so.'

Perhaps the most common reaction to a problem situation is a random hunt for solutions and sometimes this will result in success, but in school situations where there is usually a limited number of possible solutions frequent failure is likely. The need to avoid impulsivity and take time to consider options and alternatives has been identified as a key strategy in overcoming learning failure (Feuerstein 1980).



College & Career Readiness ...Life Skill description: meta-cognitive-usage-03112017

In analyzing Schoenfield's success in developing student's mathematical problem-solving ability Perkins & Salomon note the importance of fostering a general level of control that they call 'problem management':

Students learn to monitor and direct their own progress, asking questions such as 'What am doing now?', 'Is it getting me anywhere?'. 'What else could I be doing instead?'

This general metacognitive level helps students avoid persevering in unproductive approaches, to remember to check ... and so on (Perkins & Salomon 1989 p21) Donaldson (1978) quotes with approval Piaget's finding that children's reflection on problems and consideration of possibilities are important aspects of cognitive development: 'If the child is going to control and direct his own thinking, in the kind of way we have been considering, he must become conscious of it.' (p94).

Feuerstein (1980) shows how adults can play a key role in encouraging this metacognitive awareness in children. The teacher can ask children about the successes and difficulties they have had with problems. Students can be encouraged to reflect on the kinds of thinking they have been engaged in, and to be conscious of those processes that have been helpful or have hindered their progress. This meta-discourse on the problem-solving process is an application of the way Vygotsky (1978) described language as the mediator of learning. As Adey & Shayer (1994) comment:

'The language of reasoning mediates metalearning'. There is in the literature however some confusion about the meaning of metacognition, and how it is to be identified. These are important matters for if we wish to identify metacognitive development as one of the goals of teaching thinking then it is as well to be as clear as we can about what metacognition is.

Metacognition also has an important bearing on the issue of the transferability of thinking skills. So what does it refer to? Von Wright (1992) distinguishes two levels of meta-reflection. Low level reflection involves the thinker: 'reflecting on her means of coping in familiar contexts. However ... she is unlikely to be capable of reflecting about herself as the intentional subject of her own actions.' (von Wright 1992 p60-61) Higher level reflection is what we would generally call metacognition: Meta-cognitive questioning: to raise levels of awareness Page 4 of 4 1.

Describe what kind of thinking you did

- What kind of thinking did you do?
- What do you call this kind of thinking?
- Was this kind of thinking? (name a kind of thinking)

2. Describe how you did your thinking



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- How did you do this thinking?
- What did you think about? Why?
- Did you have a plan (or strategy)?

3. Evaluate your thinking

- Was your thinking good? Why?
- Did you have a good plan (or strategy)?
- How could you improve your thinking next time? adapted from Schwartz & Parks (1994)

Another way of introducing metacognitive language to children is through the use of **'think aloud'**, which model metacognitive processes. Here we raise awareness by using metacognitive language and self questioning in the way we present explanations to pupils and model a particular problem solving process. We aid metacognition by bringing to conscious awareness our thoughts and feelings, and communicate them by thinking aloud.

We need to help children do the same. Posting a list of metacognitive questions on the wall can help to remind children of the sorts of questions they can ask themselves, for example questions that assess awareness of learning

(What have you learnt? What have you found out? What did you find hard? What did you do well? What do you need to learn/do next?),

assessing attitudes and feelings (What do you like doing/learning? What do you feel good/not good about ...? What do you feel proud of?) and in setting targets (What do you need to do better? What would help you? What are your targets?)

