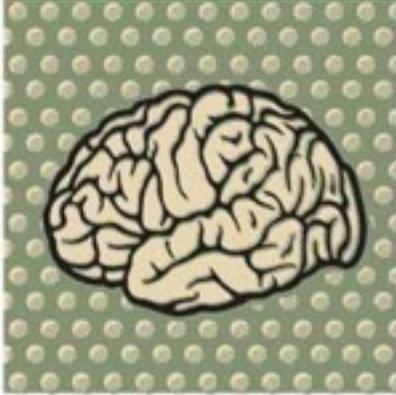


# Metacognition And Learning: Strategies For Instructional Design

by Connie Malamed



Do you know how to learn? Many people don't. Specifically, they don't know how to look inward to examine how they learn and to judge what is effective.

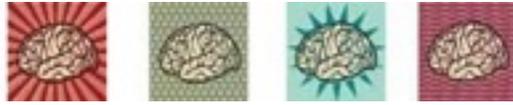
That's where metacognitive strategies come in. They are techniques that help people become more successful learners. Shouldn't this be a crucial goal of instructional design?

Improved metacognition can facilitate both formal and informal learning. It can improve the performance of new tasks on the job and help teams problem solve more effectively.

But let's start at the beginning. Here are some things instructional designers should know about metacognition.

## What is metacognition?

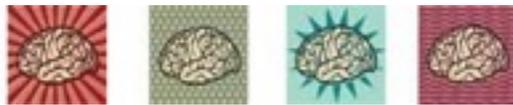
1. Metacognition is often referred to as "thinking about thinking." But that's just a quick definition. Metacognition is a regulatory system that helps a person understand and control his or her own cognitive performance.
2. Metacognition allows people to take charge of their own learning. It involves awareness of how they learn, an evaluation of their learning needs, generating strategies to meet these needs and then implementing the strategies. (Hacker, 2009)
3. Learners often show an increase in self-confidence when they build metacognitive skills. Self-efficacy improves motivation as well as learning success.
4. Metacognitive skills are generally learned during a later stage of development. Metacognitive strategies can often (but not always) be stated by the individual who is using them.
5. For all age groups, metacognitive knowledge is crucial for efficient independent learning because it fosters forethought and self-reflection.



## The Two Processes of Metacognition

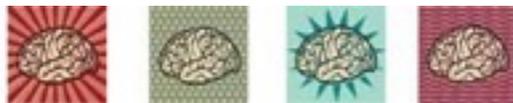
Fortunately, many theorists organize the skills of metacognition into two components. This makes it easier to understand and remember.

1. According to theory, metacognition consists of two complementary processes: 1) the knowledge of cognition and 2) the regulation of cognition.
2. **Knowledge of cognition** has three components: knowledge of the factors that influence one's own performance; knowing different types of strategies to use for learning; knowing what strategy to use for a specific learning situation.
3. **Regulation of cognition** involves: setting goals and planning; monitoring and controlling learning; and evaluating one's own regulation (assessing results and strategies used).



## Metacognition and Expertise

1. Many experts cannot explain the skills they use to elicit expert performance. (Perhaps this is due to the automatic functioning of the expert.)
2. Metacognitive strategies often separate an expert from a novice. For example, experts are able to plan effectively on a global level at the start of a task—a novice won't see the big picture.
3. Some adults with expertise in one domain can transfer their metacognitive skills to learn more rapidly in another domain.
4. On the other hand, some adults do not spontaneously transfer metacognitive skills to new settings and thus, will need help doing so.

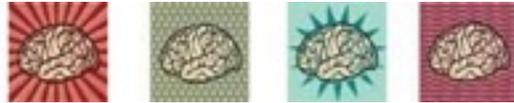


## Examples of Metacognition Skills You May Use

Successful learners typically use metacognitive strategies whenever they learn. But they may fail to use the best strategy for each type of learning situation. Here are some metacognitive strategies that will sound familiar to you:

1. Knowing the limits of your own memory for a particular task and creating a means of external support.

2. Self-monitoring your learning strategy, such as concept mapping, and then adapting the strategy if it isn't effective.
3. Noticing whether you comprehend something you just read and then modifying your approach if you did not comprehend it.
4. Choosing to skim subheadings of unimportant information to get to the information you need.
5. Repeatedly rehearsing a skill in order to gain proficiency.
6. Periodically doing self-tests to see how well you learned something.



## Metacognitive Strategies

Metacognitive strategies facilitate learning how to learn. You can incorporate these, as appropriate, into eLearning courses, social learning experiences, pre- and post-training activities and other formal or informal learning experiences.

1. **Ask Questions.** During formal courses and in post-training activities, ask questions that allow learners to reflect on their own learning processes and strategies. In collaborative learning, ask them to reflect on the role they play when problem solving in teams.
2. **Foster Self-reflection.** Emphasize the importance of personal reflection during and after learning experiences. Encourage learners to critically analyze their own assumptions and how this may have influenced their learning.
3. **Encourage Self-questioning.** Foster independent learning by asking learners to generate their own questions and answer them to enhance comprehension. The questions can be related to meeting their personal goals
4. **Teach Strategies Directly.** Teach appropriate metacognitive strategies as a part of a training course.
5. **Promote Autonomous Learning.** When learners have some domain knowledge, encourage participation in challenging learning experiences. They will then be forced to construct their own metacognitive strategies.
6. **Provide Access to Mentors.** Many people learn best by interacting with peers who are slightly more advanced. Promote experiences where novices can observe the proficient use of a skill and then gain access to the metacognitive strategies of their mentors.
7. **Solve Problems with a Team:** Cooperative problem solving can enhance metacognitive strategies by discussing possible approaches with team members and learning from each other.
8. **Think Aloud.** Teach learners how to think aloud and report their thoughts while performing a difficult task. A knowledgeable partner can then point out errors in

thinking or the individual can use this approach for increased self-awareness during learning.

9. **Self-explanation.** Self-explanation in writing or speaking can help learners improve their comprehension of a difficult subject.
10. **Provide Opportunities for Making Errors.** When learners are given the opportunity to make errors while in training, such as during simulations, it stimulates reflection on the causes of their errors.

In summary, metacognition is a set of skills that enable learners to become aware of how they learn and to evaluate and adapt these skills to become increasingly effective at learning. In a world that demands lifelong learning, providing people with new and improved metacognitive strategies is a gift that can last forever.

### References:

1. Hacker, Douglas J., John Dunlosky and Arthur C. Graesser (Eds.). *Handbook of Metacognition in Education*, 2009.
2. Pashler, H. et al., *Organizing instruction and study to improve student learning. IES practice guide*, 2007. <http://ies.ed.gov/ncee/wwc/pdf/practiceguides/20072004.pdf>
3. Smith, Cecil M. and Thomas Pourchot. *Adult Learning and Development: Perspectives From Educational Psychology*, 1998.
4. White, Barbara and John Frederiksen. A Theoretical Framework and Approach for Fostering Metacognitive Development. *Educational Psychologist*, 40(4), 211–223, 2005.
5. Wilson, Arthur L. and Elisabeth Hayes, *Handbook of Adult and Continuing Education* by American Association for Adult and Continuing Education.
6. *Handbook of Metacognition in Education* Douglas J. Hacker, John Dunlosky and Arthur C. Graesser (Eds.).