

THE THREE Ms: AN OVERVIEW

Although students spend many years in school before arriving at college, the majority of college students—as many as 80%—report that they have never been taught how to study. To help students get the most out of their learning, the Learning at Iowa project has distilled research from cognitive science to create recommendations around effective learning. Learning at Iowa revolves around the Three Ms: Mindset, Metacognition, and Memory. Each M is an essential piece of learning. This handout provides an overview of the Three Ms and how they can impact your learning.

Mindset

Successful learners know that they can learn by developing a growth mindset. A growth mindset is the belief that learning and intelligence are the result of practice and effort. Having this mindset helps you recognize that learning might not be easy and might take some time, but you can improve with the right approach.

A growth mindset helps you view challenges as learning opportunities rather than failures. Key to a growth mindset is understanding that learning comes from practice and effort. The practice and effort need to be deliberate and suited to the learning task. Deliberate practice sets improvement as the main goal, coupled with the right activities to reach that goal.

Metacognition

Metacognition means “thinking about thinking” and involves an assessment of your learning and any struggles you may have. Accurately tracking your learning can help you determine what has been working for you and what you may need to change.

Three important components of metacognition are planning, monitoring, and evaluating. Any learning task involves these three components. Metacognitive *planning* requires you to understand what you are being asked to learn or do, and it includes understanding how long a task will take. *Monitoring* is the in-the-moment awareness of your learning. As you read a chapter, are you understanding it? Or did your mind wander, leaving you unable to remember the last three paragraphs? Finally, *evaluation* is the appraisal of how things went. Did you understand all of the concepts? If not, then you can go back to metacognitive planning to get guidance learning the material.

You can engage your metacognition with goal setting (planning) for each study session and by asking yourself questions while you’re learning (monitoring and evaluating). The Learning at Iowa website has [reflective questions](#) to prompt each stage of metacognition.

Memory

The third M centers on the learning processes that produce the most effective learning. However, don't confuse "most effective learning" learning with "fast learning." Many students often prepare for exams by re-reading their notes, textbook, or other class materials. Sometimes students will even re-write their notes. These approaches may *feel* effective, but they produce superficial memories that are often insufficient and forgotten quickly.

The most effective approaches to learning can feel hard and counterproductive, even though they produce long-lasting learning. For this reason, cognitive scientists call these approaches *desirable difficulties*. They're desirable because they produce strong memories that resist forgetting, but they're difficult, because they require more effort than re-reading and similar ineffective approaches.

Two desirable difficulty approaches that are easy to use in classes are *spaced practice* and *retrieval practice*. Spaced practice means spacing your learning across time. Spreading out your learning produces better memories than cramming all of your learning into one session. But, spaced practice can be difficult because it requires a planning ahead for a schedule that where learning happens over several days or weeks, a little bit at a time.

Retrieval practice involves practice in retrieving memories. Retrieval practice can be done with any type of self-quizzing, which improves your memory for that material. Another effective way to use retrieval practice is with a "brain dump." A few hours after a lecture or completing a reading, try writing down all of the main points and concepts *without looking at any notes*. That brain dump will feel hard because you will have forgotten many pieces, but it will be effective - the information that you recalled will be strengthened in your memory, and the information you did not remember will show what you need to review.

The Three Ms can help you develop your learning skills and become an effective learner. Having a growth mindset allows you to recover from setbacks and challenge yourself. Developing metacognitive habits lets you monitor what is working for you and what isn't. And lastly, using effective learning strategies will help you develop your memory and ability to recall information.

To learn more about using Mindset, Metacognition, and Memory visit: learning.uiowa.edu/students.
