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Metacognition Fact Sheet

What it is, why AI makes it more important, and small ways to build it into any assignment

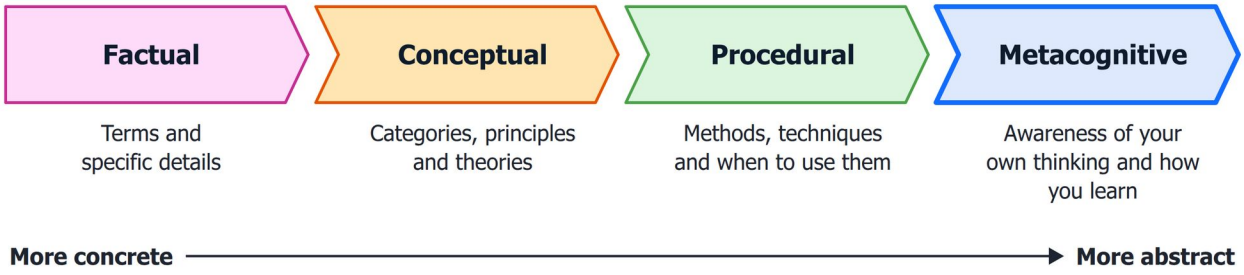
ESSENTIAL TAKEAWAY

Short answer: Metacognition is awareness and control of your own thinking. AI can improve the work without building it, so teach it on purpose. (Stanton et al., 2021; Fan et al., 2025)

Use it today: Add one question that asks students about their own thinking, before, during or after a task.

The revised Bloom's taxonomy places Metacognitive Knowledge in its Knowledge dimension, at the most abstract end of the spectrum. (Anderson & Krathwohl, 2001)

The Knowledge dimension of the revised Bloom's taxonomy
Anderson & Krathwohl, 2001



Two components, six parts

Metacognition combines knowing how you learn with controlling your thinking as you learn. (Stanton et al., 2021, adapted from Schraw & Moshman, 1995)

PART	WHAT STUDENTS DO	SOUNDS LIKE
Metacognitive knowledge: knowing how you learn		
Declarative	Know their own strengths as learners and what a task demands	"I remember better when I explain it out loud."
Procedural	Know how to use a study or thinking strategy	"To check myself, I'll close the book and write what I remember."
Conditional	Know when and why a strategy fits	"Rereading won't help here. I need to practice problems."
Metacognitive regulation: controlling your thinking as you learn		
Plan	Decide how to approach a task before starting	"What will be hardest about this?"
Monitor	Check whether they actually understand as they work	"Wait, I can follow this, but could I explain it?"
Evaluate	Look back at what worked and what to change	"My first idea missed something. Here's what."

What we know about students 17 to 24

The capacity is largely there.

The ability to judge one's own accuracy improves through adolescence and is highest in the late teens.

Weil et al., 2013

The brain isn't "finished" at 25.

Development continues gradually into the twenties, with no single finish line.

Somerville, 2016

This is a sensitive period.

Experience strongly shapes higher-order thinking, so the practice students get in our courses counts.

Larsen & Luna, 2018

It can be taught.

What many students lack is the habit, and instructors can build that practice into the work they already assign.

Stanton et al., 2021

Better work, not better learning

Recent studies point the same way: AI can improve the work without improving learning, and students may check their own thinking less along the way.

FINDING	WHAT THE STUDY SHOWED	SOURCE
Metacognitive laziness	117 university students revised essays with ChatGPT, a human expert, a writing tool or no help. The ChatGPT group improved scores most but didn't learn more, and did less self-checking along the way. The researchers called it "metacognitive laziness."	Fan et al., 2025
Smarter, none the wiser	People using AI did better on reasoning problems but overestimated their performance by even more than they improved.	Fernandes et al., 2026
Trust and critical thinking	In a survey of 319 knowledge workers, more trust in AI went with less reported critical thinking; more trust in one's own skills went with more.	Lee et al., 2025
"Your Brain on ChatGPT"	An early MIT study (54 participants) found weaker brain connectivity and poorer recall when writing with ChatGPT. It hasn't completed peer review, and others have questioned its methods. Treat it as a signal, not a settled finding.	Kosmyna et al., 2025; Stanković et al., 2026

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TRY THIS Before, during and after

Add one question to one assignment. Each asks for self-knowledge only the student has, which builds metacognition and makes the work harder to hand off to AI.

WHEN	ASK STUDENTS
Before	"What do you expect to be hardest about this?" "How confident are you, from 1 to 5?"
During	"Where did you get stuck, and what did you try?" "Name one example you considered and didn't use."
After	"What did your first idea miss?" "How sure are you now, and why did that change?"
If students use AI	"What did you check or change in the AI's answer?" "How did you use AI, and where did it help or fall short?" "Which AI suggestion did you reject, and why?" **Why reflect, not just report:** Required AI-use declarations often go uncompleted (74% of students in one study). Asking how AI helped or fell short turns disclosure into reflection. (Gonsalves, 2025; McCown, 2025)

HOW I MADE THIS

Tools: Claude (Anthropic), October 2026

What AI did: Found and summarized studies, drafted the text and built the layout.

What I did: Reviewed key sources, selected what to include, reorganized the content, revised wording over multiple rounds, and updated layouts and graphics.

What did I check or change in the AI's answer?
One example: An early draft said AI lowers the thinking behind student work. The studies show students learned about the same as with other help, so I rewrote it.

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