

MODULE 2 · THE LEARNING-SCIENCE SPINE

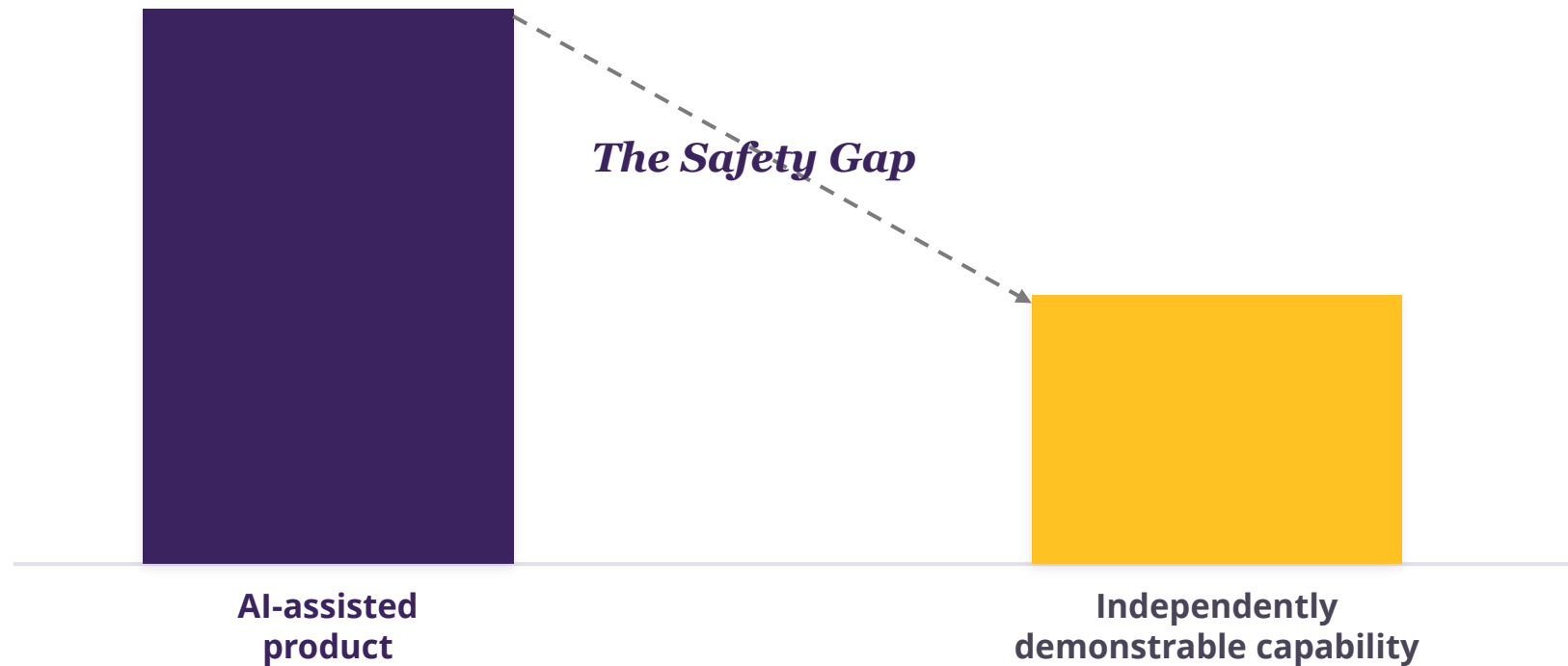
Lecture 2.1

The Safety Gap and the Novice/Expert Divide

The question is not “Should AI be allowed?” It is “Which cognitive operation must stay student-owned?”

The Safety Gap

Feeds your Friction Audit



A visibility problem — not automatically a misconduct problem.

Diagnose the gap → Sort the friction → Choose the posture → Design the sanctuary + access repair

Four examples of the Safety Gap

Feeds your Friction Audit

WRITING

A polished essay draft without argument ownership.

CODING

Correct code the student cannot debug.

LITERATURE

A smooth literature review the student cannot defend in conversation.

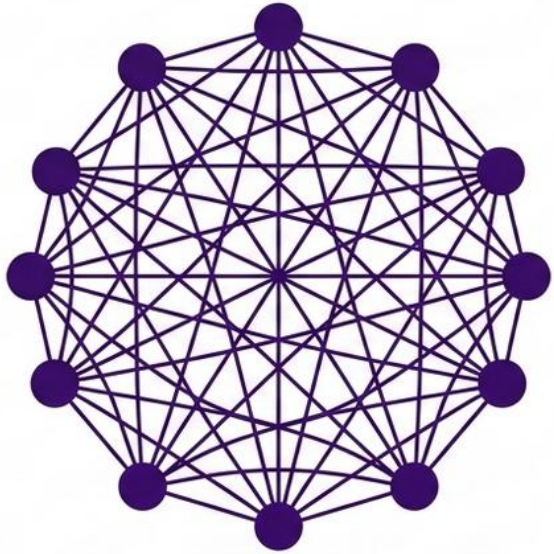
LAB SCIENCE

A clean lab report the student cannot extend to a similar lab.

These are not automatically cheating problems.
They are evidence problems: the product is visible, but the capability is not.

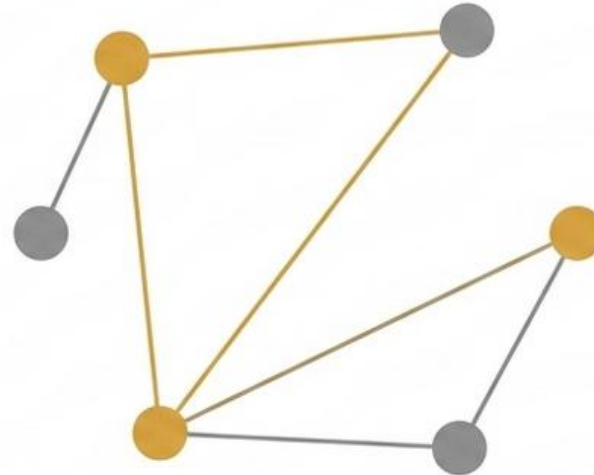
Why novices are more vulnerable

EXPERT



Has developed mental models. Can compare AI output against existing knowledge, detect errors, and push back.

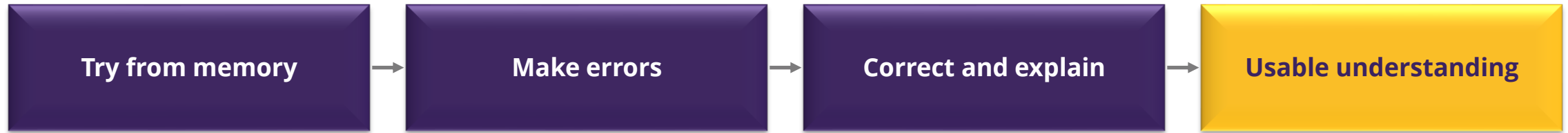
NOVICE



Has an emerging mental model. May accept fluent output too quickly because there is less to compare against.

Understanding is built through retrieval

How understanding is built



What the AI shortcut looks like



If AI does the thinking, the student loses the practice that builds usable understanding.

Same AI, different effect

Advanced learner

- 1 Has a draft to improve
- 2 Can judge suggestions
- 3 Uses AI to extend thinking

Novice learner

- 1 May not know what a good draft requires
- 2 May accept fluent suggestions too quickly
- 3 May use AI instead of doing the thinking

Visible submission, hidden capability

Visible product

what students submit: essay, code, report, presentation

Hidden capability evidence

reasoning, transfer, explanation, calibration

Course design must
make hidden
capability evidence
visible sometimes.

Oral explanation

Annotated draft

Live problem

Process note

Cognitive Sanctuary, defined

Feeds your Friction Audit

A bounded course moment that protects one essential act of student thinking from AI substitution.

Bounded

Protects the part that matters most, not the whole assignment

Specific

Names the exact act of thinking to keep student-owned.

Realistic

Fits the reality of the course you actually teach.

Design check: What part of this task must remain student-owned?

Your move for Module 2

- 1 Pick one assignment, discussion prompt, exam item, or lab.
- 2 Identify the essential cognitive operation it should build.
- 3 Mark where AI would remove that operation, and where it would remove only needless difficulty.

DELIVERABLE: name the cognitive operation, identify the safety gap, and draft one sanctuary rule.

REFLECTION PROMPT

In one sentence, explain why the same AI feedback can help an advanced writer and harm a novice writer.