

From capstone headache to course-ready improvement

Use AI tools to structure the work, not to outsource teaching judgment. You own the course problem, evidence choices, student-data protections, interpretation, and claims.

<p>1. Teaching problem</p> <p>Name the recurring course issue in neutral, observable language.</p>	<p>2. Course question</p> <p>Turn the issue into an answerable teaching and learning question.</p>
<p>3. Evidence scan</p> <p>Use Consensus, Elicit, Scholar, ASEE PEER, and library databases to find leads.</p>	<p>4. Intervention</p> <p>Design one feasible course change that targets the problem.</p>
<p>5. Evidence plan</p> <p>Choose student artifacts, reflections, rubrics, or notes that match the question.</p>	<p>6. Analysis</p> <p>Use qualitative, quantitative, or mixed methods only as strongly as the data allow.</p>
<p>7. Shareable product</p> <p>Prepare an internal memo, poster, ASEE abstract, workshop, or manuscript.</p>	

Tool roles and cautions

Tool	Useful role	Caution
ChatGPT/Claude/Codex	Draft structure, prompts, templates	Do not treat output as evidence
Consensus/Elicit	Find literature leads and extract notes	Open and verify sources
Scholar/ASEE/library	Broaden and verify source base	Record search decisions

Worked example seed

Capstone students often make design decisions without clearly using evidence, tradeoff analysis, or documented engineering reasoning. The example project tests whether a structured design-decision memo can make engineering judgment more visible.

Questions to try in Consensus or a library database

- What does engineering education research say about evidence-based decision-making in capstone design?
- How are engineering design decision-making skills assessed in student teams?
- What instructional interventions improve students' use of evidence in design decisions?
- How do students document tradeoffs, assumptions, and uncertainty in engineering design?

Before sharing or publishing

- Verify every source against the original paper or stable database record.
- Label preliminary literature notes as preliminary until the review is complete.
- Consult local IRB or human-subjects guidance before using student work for dissemination.
- De-identify examples and avoid uploading identifiable student data to public AI tools.
- Do not imply findings or improvement until data have been collected and analyzed.

Adaptation prompt

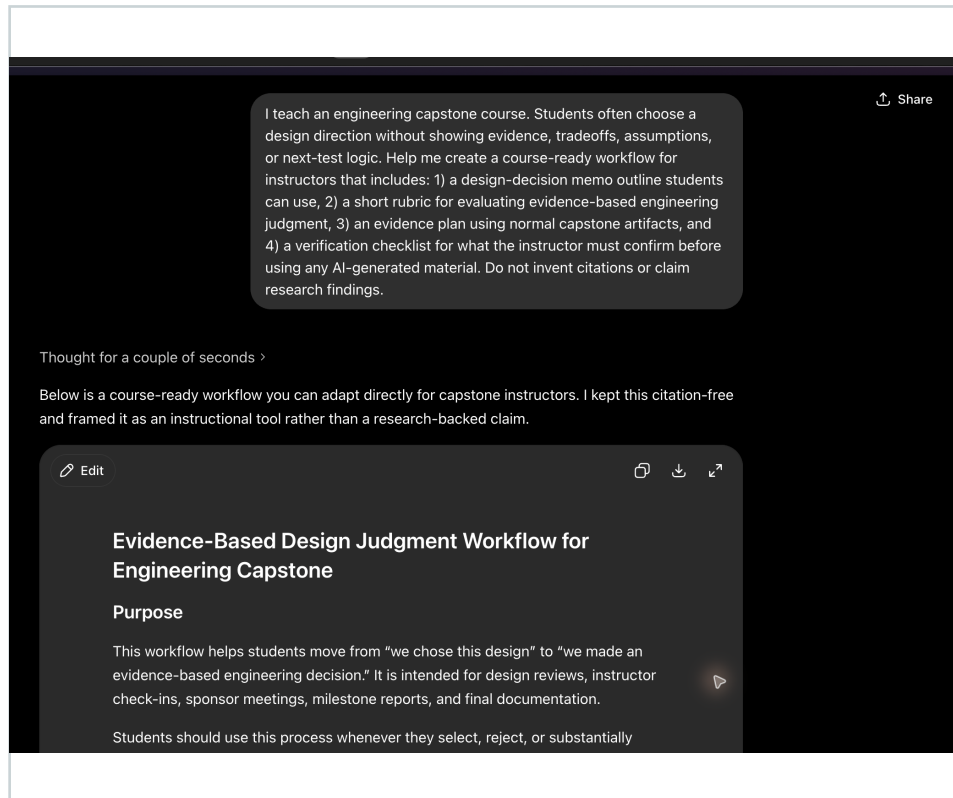
I teach capstone. My recurring course problem is [problem]. Help me turn this into a course question, a small intervention, an evidence plan, and a verification checklist. Do not invent citations or claim findings.

What the recommended tools look like on screen

These screenshots show live use of ChatGPT and Consensus for the capstone decision-making example. The workflow is useful only when the instructor keeps the human checkpoints visible.

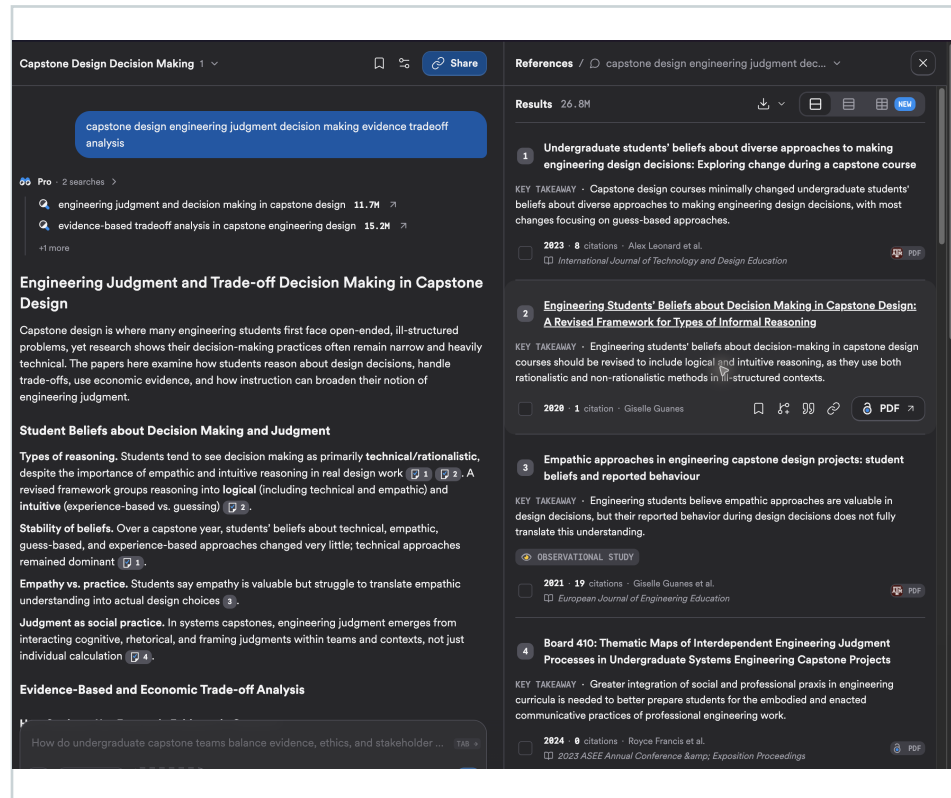
1. ChatGPT: draft the course workflow

Ask for a memo outline, rubric, evidence plan, and verification checklist. Block invented citations and findings.



2. Consensus: locate the literature lane

Use the synthesis to identify themes and candidate papers. Treat it as a search lead, not a literature review.

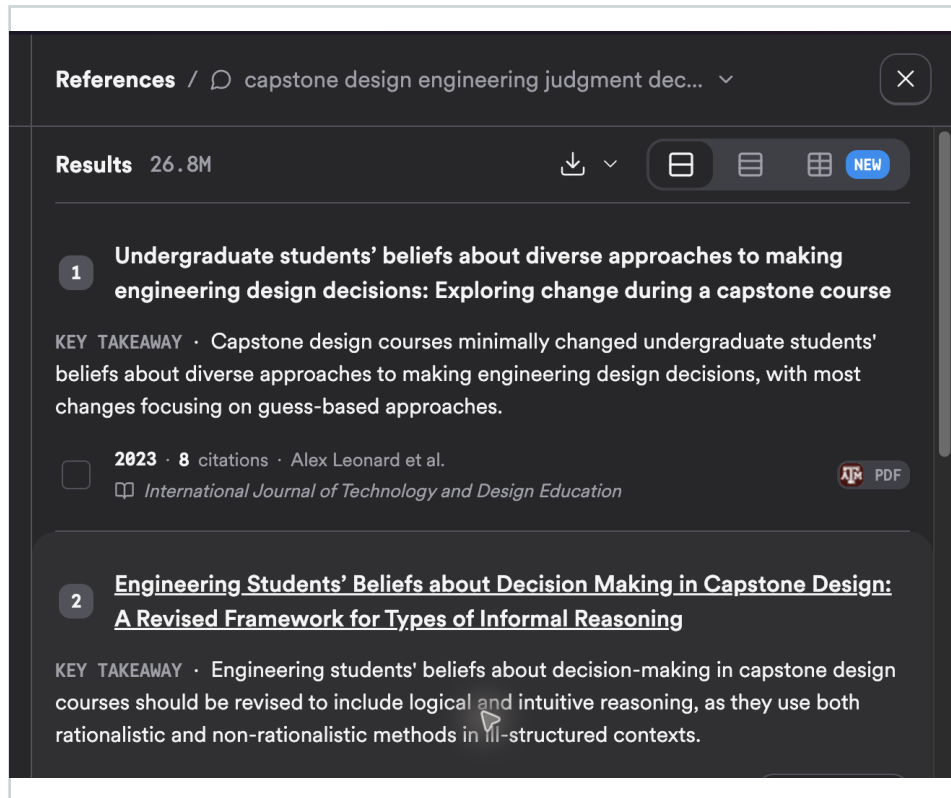


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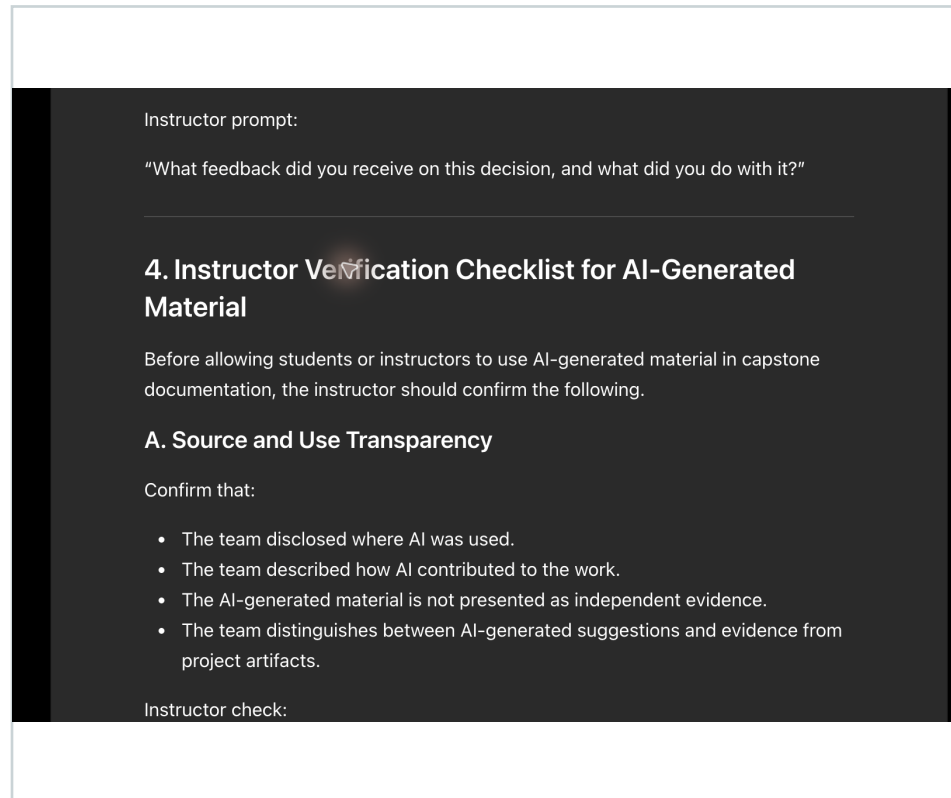
3. Consensus: build a verification queue

Open candidate papers, check fit, and log what was verified before citing anything in the teaching rationale.



4. ChatGPT: make verification explicit

Use AI to draft checks, then rely on human review for sources, technical claims, student-data protections, and IRB boundaries.



Make engineering judgment visible

Use this with capstone teams before a major design commitment.

Decision statement

What specific commitment are we making?

Alternatives

What realistic options did we compare?

Criteria and constraints

What matters, who said it matters, and how important is it?

Evidence

What data, tests, standards, literature, observations, or calculations support the choice?

Tradeoffs

What does the selected option improve, and what does it make worse?

Assumptions and uncertainty

What might be false, unknown, or still untested?

Stakeholder alignment

Whose needs or constraints shaped the decision?

Feasibility

Can we build, test, afford, maintain, and integrate this option?

Decision rationale

We recommend [selected option] because [evidence], given [criteria/constraints], while recognizing [tradeoffs/uncertainty]. Our next test is [test or evidence-gathering step].

Next-test logic

Test: _____

Data to collect: _____

Decision threshold: _____

What would cause us to revise the decision: _____

Fast rubric

- Evidence use
- Assumptions and uncertainty
- Feasibility
- AI/tool disclosure
- Tradeoff analysis
- Stakeholder alignment
- Next-test logic

AI/tool disclosure

Tool used: _____ Task: _____ Human verification: _____