



STAC

**SCIENCE & TECHNOLOGY
ADVANCEMENT CENTER**

**Evaluating and Revising AI Outputs: Helping Students
Critique Inaccurate or Biased Science Explanations**

NSTA AI in Education Pathway

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About Us

The ***Science & Technology Advancement Center (STAC)***, is a nonprofit organization that works with states, districts, and companies to design, develop and implement high quality science programs. We focus on integrating new and emerging technologies in classroom settings to support 3-dimensional learning.

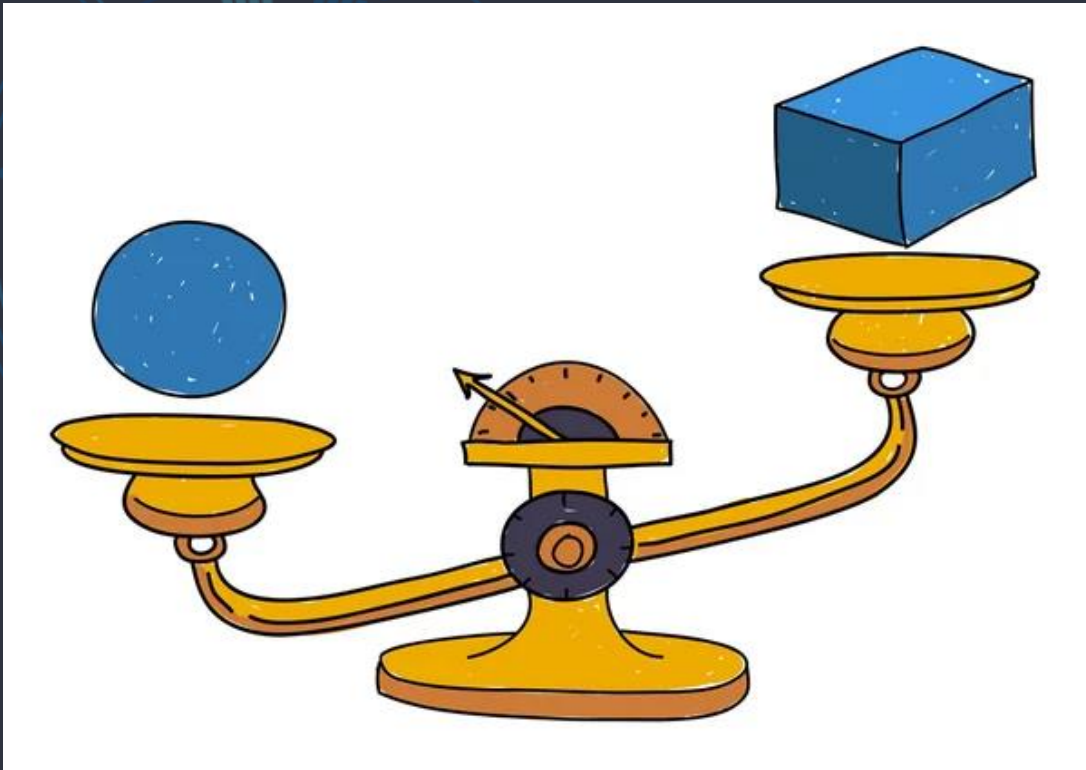
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Polished, Plausible, Problematic



AI can generate explanations that sound authoritative while still being scientifically weak

Common problems:

- inaccurate claims
- missing mechanisms
- weak or absent evidence
- overgeneralizations
- hidden cultural or scientific bias

In science classrooms, that is not just a risk it is an opportunity

The goal is not - Can students use AI?

The goal is - Can students interrogate explanations like scientists?

Reframing the Problem

If students read AI output as final truth, reasoning stops.

If students treat AI output as a claim to investigate, reasoning begins

We can position AI as:

- a draft model
- a debatable explanation
- a source with limitations
- a catalyst for critique and revision

This shifts students from passive acceptance to active sensemaking

From “What Did AI Say?” to “How Do We Know?”

Students examine an AI explanation against:

- observations from the phenomenon
- class data
- prior models
- disciplinary core ideas
- patterns and mechanisms

Productive classroom questions:

- What claim is the AI making?
- What evidence is missing?
- Where does the reasoning break down?
- What would we need to test or revise?



Steps for Students

- Step 1: Identify the AI's central claim
- Step 2: Mark what evidence the AI uses, ignores, or invents
- Step 3: Analyze whether the reasoning actually connects evidence to the claim
- Step 4: Revise the explanation to better account for the phenomenon

These steps makes critique visible and gives students a structure for disagreement

It also helps move students beyond “That’s wrong” toward “Here is why it fails scientifically”

Areas Where Students Struggle

Scientific inaccuracy

The explanation includes false, misleading content, or common misconceptions

Missing evidence

Claims are made without reference to data, observations, or accepted evidence

Incomplete mechanism

The explanation names a result but does not explain how or why it happens

Embedded bias

The explanation centers some experiences, assumptions, or examples while ignoring others

Example

Phenomenon

A sealed glass jar containing only moist soil and a small green plant has been sitting on a sunny windowsill for three years without being opened or watered, yet the plant continues to grow and the soil remains damp.

Explanation

The plant is able to survive because it creates its own food and water from the sunlight hitting the leaves. The energy from the sun is strong enough to turn into new leaves and stems, which is why the plant gets bigger over time even though nothing is added to the jar. Any extra water stays in the soil because the roots act like a storage tank, holding onto the moisture so it never runs out or disappears. As long as the sun keeps shining, the plant has everything it needs to keep making more matter and staying healthy forever.



Example

Phenomenon

A patch of bare soil was left behind after a sidewalk was repaired, and within a few months, small weeds and grasses began growing there. Over more time, taller plants started appearing, and the area looked more crowded and different than it did at first.

Explanation

The empty soil first gets covered by small plants because they are the fastest to grow in open spaces. As more plants move in, the area changes because the earlier plants make it easier for bigger plants to grow there later. Eventually, the plants that grow tallest take over the space, so the kinds of plants in the area keep changing over time.



Evaluating and Revising AI Outputs





Thank you!

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NSTA Survey Session 7





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