

Tech Snacks

Spotlight Teaching Technique: “Concept Attainment”

Often when introducing a new concept (e.g., “impressionism”) it’s tempting to name the concept, explain it, give a few examples, and then move on, hoping the students have internalized the meaning. The “concept attainment” technique is an inductive teaching method that reverses this process, requiring students to use logic and contrast to identify the concept themselves. It is primarily used to introduce concepts but also includes many natural opportunities for formative assessment.

5 basic steps for a concept attainment activity

Introduce the concept: Introduce the chosen concept to the students only through examples and non-examples. (Do not explain the concept! Simply give “yes” and “no” examples.)

Students identify the concept’s critical attributes: Group the students and ask them to identify the characteristics or attributes that seem to define the concept.

Students test their theory: Provide additional examples for them to test their theories out. This step should include broader and more difficult distinctions.

Students formulate the concept: Either in groups or together as a class, use the critical attributes to formulate a definition of the concept.

Apply the concept: Provide students with other examples and/or real-life situations to have them apply the concept.

[This video](#)¹ from Jennifer Gonzalez’s *Cult of Pedagogy* blog does an excellent job of demonstrating the technique.

Example concepts for concept attainment

History: communism, democracy, weak (strong) federal government

Art/literature: impressionism, romanticism, realism, perspective, tone/style

Health: healthy diet, SMART goals

Math: “what’s the rule?”, triangles (non-triangles)

Language: parts of speech, figurative language

Engineering/Trades: safety, defects and discontinuities, classifications of materials

Natural Science: genotypes,² kinetic energy, potential energy

Variations of concept attainment

Contrasting cases: After completing the concept attainment activity, introduce several examples of the concept that have important differences and work to articulate the nuances of those differences

Exploring processes: Provide students with a list of steps that may or may not belong to a given process and use the concept attainment activity to have them sort the steps. Have them sort which belong to the process and which don’t. Variation: omit some steps and have them evaluate which steps are missing.

Using ChatGPT to generate examples

As scary as ChatGPT might sound, it can be a really useful tool for quickly generating examples for concept attainment and related activities. See [this article](#)³ for guidance.

¹ https://www.youtube.com/watch?v=VxvX6B_0nnl&t=2s

² Example: <https://juliechompson.wordpress.com/2011/12/23/concept-attainment-model-to-teach-genetics/>

³ <https://www.cultofpedagogy.com/chatgpt-example-machine/>

Refresher: Formative Assessment

It's important to recognize that there are gaps between **what we think we're teaching** and **what is actually being learned** in the classroom. The continuous monitoring of these gaps, with the intent of closing them, is usually referred to as "formative assessment" (or sometimes less formally, "checking for understanding"). Even small formative assessment strategies can make a big difference in student learning.

What is Formative Assessment?

Formative assessment is different from "summative assessment," which may be used in the form of chapter quizzes, unit tests, papers, portfolios, presentations, and final exams. Formative assessment is used not to measure students' success in reaching official course outcomes or standards, but rather:

- to assess where students are at in terms of their knowledge/proficiency
- to help students understand and monitor their own learning
- to assess and improve one's own techniques as an instructor

Why should I use it?

Instructional feedback on both sides – Formative assessment practices can help both you and your students evaluate their level of performance and make adjustments.

Student engagement – Pausing to check for understanding, providing students with opportunities to practice skills/concepts, and using student self-assessment activities can help students stay attentive in class.

Low-stakes, low-risk assessment – Failure is a necessary part of the learning process. Low-stakes activities help provide a learning environment in which it is safe to "fail."

Examples of formative assessment

"Checking for understanding" – Use a wide range of strategies to assess whether students are following and processing the material. This can happen either in real-time or from one class period to the next. Adjust your pace and approach if students seem lost.

Examples: embedded lecture quizzes, polling apps (Kahoot!, PollEverywhere), minute papers, entrance/exit slips, think-pair-share discussions

"Guided practice" – Lead the students to repeat the process you're modeling; provide corrective feedback and incrementally move to more difficult versions of that task.

Examples: scaffolding in general, the "I-we-you" modeling approach⁴

"Metacognition" opportunities – For an assignment or a certain portion of multiple assignments, require students to check or reflect on their own understanding of content, as well as the effectiveness of their own learning strategies.

Examples: self-grading, midterm grade-check assignments, exam "postmortems"⁵

Clear, timely feedback – Ensure students know what they got wrong and why, as soon after the learning activity as possible. Provide specific, actionable feedback so that students understand their performance gap and have tools to improve it.

Examples: indicating incorrect quiz questions (if not answers) in Brightspace, embedded lecture quizzes, grading rubrics (efficiency for the instructor and clarity for the student)

⁴ <https://classteaching.wordpress.com/2018/12/05/i-we-you-a-simple-approach-to-modelling/>

⁵ <https://danawanzer.com/exam-post-mortem/>