

How People Learn

Brain, Mind, Experience, and School (Bransford et al.)

- Understand the evolution of learning theories
- Grasp the three core findings of modern learning science
- Reflect on your own learning strategies

From Speculation to Science

- 19th century: Behaviorism – learning as stimulus–response
- Limitations: ignored thinking & understanding
- 1950s: Cognitive Revolution – interdisciplinary focus
- Today: Emphasis on knowledge, context, and transfer

Learning with Understanding

- Facts are necessary but not enough
- Experts organize knowledge around key concepts
- Understanding supports transfer to new problems
- Example: Arteries & veins – structure & function, not just facts

Pre-Existing Knowledge

- Learners come with prior beliefs & mental models
- Misconceptions (e.g., flat earth) persist unless engaged
- Teachers must elicit and reshape prior ideas
- Fish Is Fish story illustrates risks of ignoring preconceptions

Active Learning & Metacognition

- Learners must take control of their learning
- Metacognition: planning, monitoring, self-reflection
- Reciprocal teaching & self-questioning strategies
- Teacher Models: A = activity only, B = activity + content, C = student ownership

Implications for Teaching

- Draw out and build on prior knowledge
- Teach fewer topics in greater depth
- Integrate metacognition into every subject
- Use formative assessments to reveal student thinking

Designing Learning Environments

- Learner-centered: builds on students' knowledge & culture
- Knowledge-centered: emphasizes deep understanding
- Assessment-centered: ongoing formative feedback
- Community-centered: collaboration & safe risk-taking

Rescue at Boone's Meadow

While hiking in Boone's Meadow, you discover a large bald eagle that has been injured and is stranded in the middle of a stream. A biologist in town says it must be taken to the wildlife center immediately for treatment. The eagle is too weak to fly. You have several possible ways to get help:

- Hiking through the forest (steep terrain, slow pace).
- Driving around the long route by road (longer distance, but steady).
- Using a small ultralight airplane available at a nearby field (fast, but limited fuel and weight capacity).

You must decide: what's the best way to rescue the eagle? How will you plan the trip so it arrives safely and quickly?

Rescue at Boone's Meadow

- **Walking speed:** 3 miles per hour on flat ground, 2 mph through forest.
 - **Driving route:** 15 miles around the meadow, average 30 mph.
 - **Ultralight plane:**
 - Speed = 40 mph.
 - Fuel = 1 gallon per 10 miles.
 - Tank = 2 gallons full.
 - Maximum weight = pilot + one passenger (cannot carry eagle crate if a second person is inside).
 - **Eagle in crate:** weight 25 lbs.
- Weather:** clear skies, no delay.

Conclusion

- Education is not just about memorizing facts, but about fostering understanding, transfer, and lifelong learning.

“Knowing is not remembering, it is being able to find and use information.” –
Herbert Simon