RESEARCH SNAPSHOT

How People Learn:
Brain, Mind, Experience, and School

About

"How People Learn," published by the National Academy Press, is a well-recognized report on the theories and principles of learning emerging from diverse disciplines, which contribute to how people approach teaching and learning, especially with regard to curriculum development, teaching practices, and assessment measures. Bransford, Brown, and Cocking emphasize that, "there is no universal best teaching practice" (p. 22); teaching strategies serves different purposes for different contexts. Understanding learning principles, however, helps teachers make informed decisions about which strategies to choose for particular purposes.

Learning With Understanding

Learning with understanding, emphasizes organizing course content into a *conceptual framework*. Understanding the relationships between facts, and understanding when and where concepts are applicable, can help students apply concepts to other contexts and facilitate problem solving or transfer of knowledge. The following example illustrates learning with understanding:

> "A pronounced difference between experts and novices is that experts' command of concepts shapes their understanding of new information: it allows them to see patterns, relationships, or discrepancies that are not apparent to novices. They do not necessarily have better overall memories than other people. But their conceptual understanding allows them to extract a level of meaning from information that is not apparent to novices, and this helps them select and remember relevant information. (p. 17)"

Prior Knowledge

Humans are seen as coming into learning environments with a base of prior knowledge, upon which new learning is constructed. For the learning outcome to meet the teacher's expectations, the teacher must elicit students' prior knowledge, and enable students to build on or challenge those understandings. As lessons progress, teachers can also use formative assessments to makes students' developing knowledge more visible.

Active Learning

Active learning involves enabling students to take control of, monitor, and assess their own learning. Bransford, Brown, and Cocking state that, "Many important activities that support active learning have been studied under the heading of metacognition (p. 12)." Teachers can encourage active learning and metacognition, through practices that "focus on sense- making, self-assessment, and reflection on what worked and what needs improving" (12). Instead of focusing on products, active learning focuses on enabling students to process content.

Key Findings and Implications for Teaching

- "Students come to the classroom with preconceptions about how the world works. If their initial understanding is not engaged, they may fail to grasp the new concepts and information that are taught, or they may learn them for purposes of a test but revert to their preconceptions outside the classroom" (14-15).

- Implication for teaching: "Teachers must draw out and work with the preexisting understandings that their students bring with them" (19).

- "To develop competence in an area of inquiry, students must: (a) have a deep foundation of factual knowledge, (b) understand facts and ideas in the context of a conceptual framework, and (c) organize knowledge in ways that facilitate retrieval and application" (16).

- Implication for teaching: "Teachers must teach some subject matter in depth, providing many examples in which the same concept is at work and providing a firm foundation of factual knowledge" (20).

- "A 'metacognitive' approach to instruction can help students learn to take control of their own learning by defining learning goals and monitoring their progress in achieving them" (18).

- Implication for teaching: "The teaching of metacognitive skills should be integrated into the curriculum in a variety of subject areas" (21).

Designing Classroom Environments

- "Schools and classrooms must be learner centered." (23)

- "To provide a knowledge-centered classroom environment, attention must be given to what is taught (information, subject matter), why it is taught (understanding), and what competence or mastery looks like" (24).

- "Formative assessments—ongoing assessments designed to make students' thinking visible to both teachers and students—are essential. They permit the teacher to grasp the students' preconceptions, understand where the students are in the 'developmental corridor' from informal to formal thinking, and design instruction accordingly. In the assessment-centered classroom environment, formative assessments help both teachers and students monitor progress" (24).

- "Learning is influenced in fundamental ways by the context in which it takes place. A community-centered approach requires the development of norms for the classroom and school, as well as connections to the outside world, that support core learning values" (25).