How College Students Learn

Gerunda B. Hughes, Ph.D.
Department of Curriculum & Instruction
Howard University
October 12, 2005
How College Students Learn?

- Neuroscientist
- Nutritionist
- Anthropologist
- Linguist
- Developmental Psychologist
- Social Psychologist
- Instructional Technologist
- Content Curricular Specialist
- Assessment & Measurement Specialist
- Cognitive Scientist
How College Students Learn

By Training, I am none of these...

And yet, as a Professional Educator,
I am concerned with all of these.
Overview

- How do people learn?
- What are some recent developments in the science of learning?
- What are some key principles about learning?
- How does the design of learning environments facilitate or inhibit learning?
- What are the implications of the research on learning for teaching, learning, and assessment at Howard University?
How People Learn

Think of a time when you learned how to do something or understood a concept for the first time ... 

- What made the experience successful?
- What changes occurred within you as a result of what you learned?
How College Students Learn

- Do college students learn the way you and I (experts in our respective fields) do?
- What effects do our ways of teaching and assessing have college students’ learning?
- What can we learn from the research on teaching, learning, and assessing in K-12 environments that can be useful in post-secondary education.
Theories about Learning

- Constructivist Theory
- Behaviorist Theory
- Motivation Theory
- Socio-cultural Theory
- Social Learning Theory
- Item Response Theory
Recent Developments on Learning

- Research from cognitive psychology has increased understanding of the nature of competent performance and principles of knowledge organization that underlie people’s abilities to solve problems in mathematics, science, social studies, history, and literature.

- Research on learning and transfer has shed light on important principles for designing learning experiences that enable people to use what they have learned in new settings.
Recent Developments on Learning

- Research in social psychology, cognitive psychology, and anthropology is demonstrating that all learning takes place in settings that have particular sets of cultural and social norms and expectations and that these settings influence learning and transfer in powerful ways.

- Collaborative studies of the design and evaluation of learning environments among cognitive and developmental psychologists and educators are yielding new insights into the nature of teaching and learning as these take place in a variety of settings.
Recent Developments on Learning

- Neuroscience is beginning to provide evidence for many principles of learning; in particular how learning changes the physical structure and organization of the brain.

- Emerging technologies are facilitating and enhancing teaching, learning, and assessment in ways that were unimagined or not yet revealed to the general public even a few years ago.
Learning with Understanding

Key Principles

1. It is vital to engage students’ preconceptions about what they have learned and are learning.

2. Understanding requires factual as well as conceptual knowledge, and the two work together to maximize transfer of learning.

3. A meta-cognitive approach to teaching and assessing enables students to self-monitor their learning.
Addressing Preconceptions

- Question 1: Who enters the learning environment with more preconceptions? A first-grader or a college freshman?
- Question 2: Who has the more difficult job (potentially) of engaging students’ preconceptions and pre-existing knowledge? A first grade teacher or a college professor?
Addressing Preconceptions

- Students come to formal education with a range of prior knowledge, skills, beliefs, and concepts that significantly affect their abilities to remember, reason, solve problems, and acquire new knowledge.

- If students’ initial ideas and beliefs are ignored, the understandings that they develop can be very different from what is intended.
Common (Mis)conceptions about Mathematics

- Mathematics is just about learning how to compute.
- Mathematics is about “following rules” to get the correct answer.
- Some people have the ability to “do mathematics” and most do not.
- Mathematical concepts used to build the pyramids were developed by European mathematicians.
Both factual knowledge and conceptual or relational knowledge are important for learning.

How deeply a student understands a concept will affect the degree to which she is able to transfer that knowledge to a new situation.
Factors that Influence Transfer

- Degree of mastery of the original subject.
- Time to learn.
- Motivation to learn.
- Amount of active or experiential learning engaged in by student.
- Level of active or experiential learning engaged in by student.
- Cultural norms and expectations.
Meta-cognitive Approaches

- Meta-cognition refers to people’s knowledge about themselves as information processors.

- Meta-cognition includes knowledge about what we need to do in order to learn, remember, and reason on information.
Meta-cognitive Approaches

- Make sure that students understand what the learning objectives are.

- Build learning and assessment environments that honor their informational needs and encourage their participation.
Meta-cognitive Approaches

- Involve students in the development of assessments; make the process transparent.

- Make students the primary users of assessment results.
Designing Learning Environments

Environments that help Students Learn

- Learner-Centered
- Community-Centered
- Knowledge-Centered
- Assessment-Centered
Learner-Centered Environments

- Pay careful attention to the knowledge, skills, attitudes, and beliefs that learners brings to the educational setting.
Knowledge-Centered Environments

- Focus on the kinds of information and activities that help students develop an integrated understanding of a discipline.

- Include an emphasis on helping students to become meta-cognitive by asking for clarification when needed.
Assessment-Centered Environments

- Provide opportunities for feedback and revision.
- Align what is assessed with the learning goals.
- Involve students in the assessment process.
- Use formative assessment continuously.
Assessment-Centered Environments

- Understand the different purposes of formative and summative assessment and use them accordingly.
- Use assessments that yield accurate information about student learning.
- Make appropriate inferences about student learning, given the purpose of the assessment.
Community-Centered Environments

- Encourage students to learn from one another.
- Create an environment in which students recognize that scholarship is important among community members.
- Interact with students around events of interest outside the classroom setting.
Putting the Principles to Work to Improve Student Learning

- Draw out and work with pre-existing understandings students bring to the learning environment.
Putting the Principles to Work to Improve Student Learning

- Monitor your teaching as you encourage students to monitor their own learning.
Putting the Principles to Work to Improve Student Learning

- Teach for understanding and meaning.
Implications for TLA at HU

- Give each student a course syllabus at the beginning of the semester.
- Use different instructional techniques; actively engage students in the learning process.
- Assess often, and give useful feedback.
- Use a variety of assessment formats for formative assessment purposes.
Implications for TLA at HU

- Engage in action research, individually or with colleagues, with the goal of improving student learning.

- Participate in the annual “Mary Rhodes Hoover Culturally Appropriate Teaching Conference.”

- Be involved in helping your school or college implement its assessment plan.
Questions & Discussion

Thank you!