Critical Thinking and Diversity

Why This is Necessary in Today's Classroom

(Material courtesy of the American Meteorological Society Education Division)

Introduction: What is Critical Thinking?

- Questions to Ponder:
  - What is critical thinking?
  - What are the benefits of being a critical thinker?
  - What are some examples of teaching approaches that nurture critical thinking?
  - Can critical thinking be enhanced through technology?
- We will identify cognitive skills and affective attributes that are central to critical thinking.
- The purpose of this module is to provide an increased appreciation for critical thinking and its use in the classroom

Science and Critical Thinking

- Science is a method or process of searching for fundamental and universal principles that govern the physical world.
- Courses such as Earth Science provide opportunities for learners to practice science and scientific thinking by employing the scientific method (recall the scientific method from earlier discussions).
- The scientific method is the scientist's way of applying critical thinking to investigate nature.
- Recognizing the powerful potential of critical thinking in problem solving, decision making, and learning, scholars and educators from outside the scientific disciplines in recent years have developed intense interest in examining, codifying and more broadly applying critical thinking.

Definitions of Critical Thinking

- There are many definitions of critical thinking. One such listing can be found at www.kcmetro.cc.mo.us/longview/ctac/definitions.htm, as compiled by Barbara Fowler of Longview Community College.
- One of which states: Critical Thinking is "a process which stresses an attitude of suspended judgment, incorporates logical inquiry and problem solving, and leads to an evaluative decision or action."

- This representative definition indicates that critical thinking is a combination of:
  - cognitive skills (e.g., interpretation, analysis, evaluation, inference, explanation, and self-regulation) and
  - affective attributes (e.g. inquisitiveness, open-mindedness, trustful of reason, flexible, focused in inquiry, fair-minded in evaluation, honest in facing personal biases, prudent in making judgments).
- See "Critical Thinking: What It Is and Why It Counts" by Peter A. Facione, at: www.insightassessment.com/pdf_files/what&Why98.pdf.

- Over the coming weeks we will address some of the following questions with regards to critical thinking:
  - Why is the way you teach important in the teaching of critical thinking?
  - What are the benefits of being a critical thinker?
  - What are some examples of teaching approaches that nurture critical thinking?
  - Can critical thinking be enhanced through technology?
  - How do I assure that I am including critical thinking as a course objective and that the way I teach is directed towards successfully attaining that objective?
  - How do I get started?

Cognitive Skills	**Affective Attributes**
Interpretation	Inquisitiveness
Analysis	Systematic
Evaluation	Analytical
Inference	Open-minded
Explanation	Fair-minded
Self-regulation	Judicious
Transfer insights into new contexts	Truth-seeking
Explore Theories, arguments	Reasoning with Confidence
Clarifying Conclusions	Independent thinking

Cognitive Skills	**Affective Attributes**
Developing criteria for evaluation	Insightful
Evaluating Data for Credibility	Suspending Judgment
Formulating significant questions	Intellectual integrity
Generating Solutions to problems	Perseverance
Assessing Solutions	Intellectual Humility
Making Interdisciplinary connections	

Cognitive Skills	**Affective Attributes**
Questioning Theories	
Comparing Interpretations or theories	
Evaluating Interpretations or theories	
Designing models	
Testing models	
Interpolation	
Prediction	