

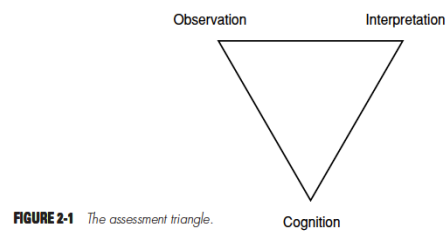
Linking Learning Objectives to Assessment

Dr. Bruce Herbert

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Pillars of Learning Assessment

- Model of how students represent knowledge and develop competence in the subject domain
- Tasks or situations that allow one to observe students' performance
- Interpretation method for drawing inferences from the performance evidence



(Pellegrino et al., 2001)

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Linking Learning Goals and Assessment

The model of student knowledge representation and disciplinary competence is explicitly or implicitly stated in our learning goals.

(Pellegrino et al., 2001)


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In Science Education

- Classification of mental faculties led to cognitive domain, affective domain, and psychomotor domain.
- Reasons for imbalanced attention to affective domain include:
 - Archetypal image of science itself, where reason is separated from feeling
 - Long-standing cognitive tradition of science education
 - Confusing definitions of affective constructs
 - Underdeveloped affective assessment practices


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Affective Domain




The affective domain (from the Latin *affectus*, meaning “feelings”) includes a host of constructs, such as attitudes, values, beliefs, opinions, interests, and motivation.

It describes learning objectives that emphasize a feeling tone, an emotion, or a degree of acceptance or rejection.

Affect is not just a simple catalyst, but a necessary condition for learning to occur.

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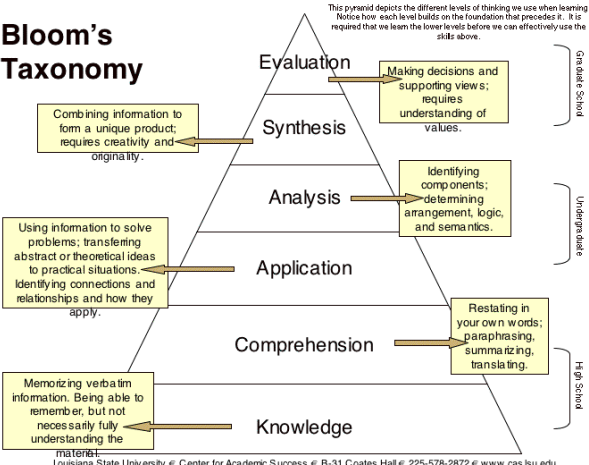
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Learning Objectives

Skill Development in the Cognitive and Affective Domain

“Higher order thinking involves a cluster of elaborative mental activities requiring nuanced judgment and analysis of complex situations according to multiple criteria.”

Bloom's Taxonomy



This pyramid depicts the different levels of thinking we use when learning. Notice how each level builds on the foundation that precedes it. It is required that we learn the lower levels before we can effectively use the skills above.

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Image Source: <http://www.biology.lsu.edu/heyrjay/Bloom's%20Taxonomy.gif> 2012 GSA/NAGT Short Course

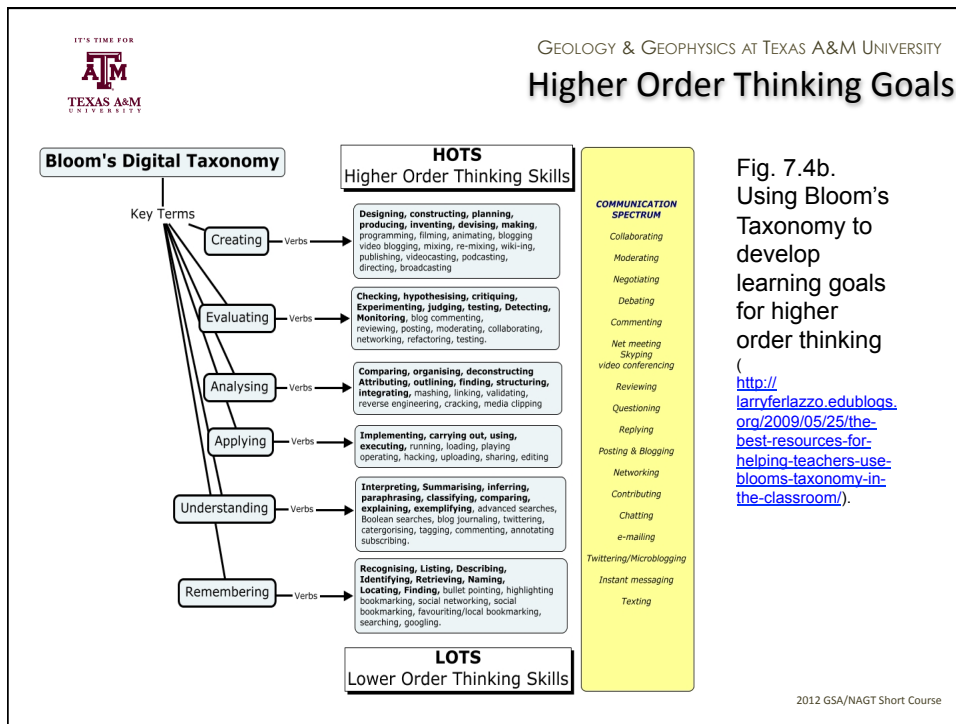


Fig. 7.4b. Using Bloom's Taxonomy to develop learning goals for higher order thinking (<http://larryferlazzo.edublogs.org/2009/05/25/the-best-resources-for-helping-teachers-use-blooms-taxonomy-in-the-classroom/>).

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Resources: Higher Order Thinking Goals

- Science College Board Standards for College Success:
<http://research.collegeboard.org/services/scas>
- AACU VALUE: Valid Assessment of Learning in Undergraduate Education:
<http://www.aacu.org/value/index.cfm>

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Resources: Disciplinary Learning Goals

- Synthesis of Research on Thinking and Learning in the Geosciences: http://serc.carleton.edu/research_on_learning/synthesis/index.html
- SERC Designing Effective and Innovative Courses: <http://serc.carleton.edu/NAGTWorkshops/coursestudies/index.html>
- Earth Science Literacy Initiative: <http://www.earthscienceliteracy.org/>

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Last Activity: Teaching Goals Inventory – What learning goals do you value?

Working together in small teams, complete the Teaching Goals Inventory. Discuss the results with your team and how the valued goals you identified support student learning in your courses and programs. We will reflect our results as a group.

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