Using Technology for Active Learning in General Education Geology Labs

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What is active learning?

• Students are engaged in activities that promote analysis, synthesis, and evaluation of class content (Blooms Taxonomy)

• Examples: the “one minute paper,” wait time, active listening, think-pair-share, concept maps, etc.
How can we use technology to promote active learning?

• What is the Scope-On-A-Rope (SOAR)?
  o Hand-held video microscope
  o Magnify any object from 1-200 times by simply touching it
  o Easy to use, durable, portable, promotes cooperative learning

• **LSU’s Scope-On-A-Rope Program**
  o Two decades of pioneering the use of video microscopes in education
Climbing to the Top of Blooms

BLOOMS TAXONOMY

EVALUATION
Assessing theories; Comparison of ideas; Evaluating outcomes; Solving; Judging; Recommending; Rating

SYNTHESIS
Using old concepts to create new ideas; Design and Invention; Composing; Imagining; Inferring; Modifying; Predicting; Combining

ANALYSIS
Identifying and analyzing patterns; Organisation of ideas; recognizing trends

APPLICATION
Using and applying knowledge; Using problem solving methods; Manipulating; Designing; Experimenting

COMPREHENSION
Understanding; Translating; Summarising; Demonstrating; Discussing

KNOWLEDGE
Recall of information; Discovery; Observation; Listing; Locating; Naming

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Climbing to the Top of Blooms

• Can use the SOAR during instruction to build the base of the pyramid
  – Students become comfortable they’re all receiving the same level of instruction

• This encourages higher-order thinking (e.g., practical application) during laboratory time
Lab Activity #1

• Sediment Texture: Size
  – Use SOAR during instructional overview of sediment grain size
    • Coarse = gravel
    • Medium = sand
    • Fine = silt/clay

Learning Objective: Students will learn the size classes of clastic sediments.

Bloom’s Taxonomy: Knowledge
Lab Activity #1

• Sediment Texture: Size
  – Use SOAR to illustrate similar grain size in lithified sediment (i.e., clastic sedimentary rocks)
    • Coarse = conglomerate
    • Medium = sandstone

Learning Objective: Students will learn how the size classes of clastic sediments translates to the size class of sedimentary rocks.

Bloom’s Taxonomy: Knowledge
Lab Activity #1

• Sediment Texture: Size
  – Students will then demonstrate understanding of grain size in sediments and sedimentary rock

Learning Objective: Students will learn how the size classes of clastic sediments translates to the size class of sedimentary rocks.

Bloom’s Taxonomy: Comprehension
Lab Activity #2

• Sediment Texture: Shape
  – Use SOAR to show volcaniclastic sediment samples
  • Angular *sand-sized* clasts
  • Rounded *sand-sized* clasts

*Learning Objective:* Students will learn roundness and angularity.

*Bloom’s Taxonomy:* Knowledge

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Lab Activity #2

• Sediment Texture: Shape
  – Students will relate the shape to other clast sizes
    • Angular gravel-sized clasts (breccia)
    • Rounded gravel-sized clasts (conglomerate)

Learning Objective: Students will learn roundness and angularity.

Bloom’s Taxonomy: Application
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