Classroom Assessment: Tried, True, and Timely

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Session Goal

Upon completing this session, you will have chosen an assessment goal and identified a relevant technique/tool to be used in your class
QUIZ! Evidence-Based Responses, Please!!

- Formative classroom assessment results in higher achievement True/False?
- Classroom assessment is impractical in large classes True/False?
- Active learning generally results in large conceptual gains True/False?
Assessment?

What is the greatest barrier to the practice of classroom assessment in higher education?
Greatest Barriers

- **Time** (in class, analysis)
- **Untrained faculty** (clueless!)
- **Apathy** (already doing it!)
- **Fear** (external control, misuse)
- **Unsure & anxious** (reliability, validity)
- **Lack models** (techniques, tools)
Features of the FLAG

❖ Assessment Basics
  ◆ “What is this assessment business all about?”

❖ Making Goals
  ◆ “What do you want to measure?”

❖ Classroom Assessment Techniques (CATs)
  ◆ “How do you measure it?”

❖ Searchable Database—Toolbox
  ◆ “What are good tools for measurement?”

❖ Other Resources
  ◆ “What good resources are out there?”
Minute Paper

- Take a few minutes at the end of class and ask for a written response to:
  - “What was the most important concept you learned in class?”
  - “What important question remains unanswered?”
  - “What was the muddiest point of this class?”

- **Few Minute Paper:** Students reach consensus in groups, submit written report

- **Analysis:** Sort into themes (use cards)
Mathematical Thinking

- Fault Finding and Fixing: Checking results and finding mistakes
- Plausible Estimation: Making plausible estimates of quantities that are not known
- Creating Measures: Modeling and defining new concepts
- Reasoning from Evidence: Organizing unsorted data and drawing conclusions
- Convincing and Proving: Judging statements and creating proofs
Concept Tests

- Quick feedback on conceptual (not factual) understanding
- Instructor gives conceptual question with choices (common “misconceptions”)
- After a minute, whole class responds (hands, flash cards)
- Instructor assesses responses: If most incorrect, pair up do discuss (peer teaching)
- Class response again to gauge mastery; instructor adapts in real time
Imagine you are standing on the surface of the moon, holding a pen in one hand. If you let go of the pen, what happens to the pen?

- A. Floats away **52%**
- B. Floats away **25%**
- C. Drops to surface **21%**
Conceptual Diagnostic Tests

- Assessment of prior knowledge of students entering a course

- Ideally based on “misconceptions” research in a specific discipline, revealed in “student thinking” interviews

- Measures pre/post conceptual gains as a summative assessment

- Follow protocol for field-tested instruments; may use individual items on Concept Tests
Student Assessment of Learning Gains (SALG)

- Probes learning gains that students perceive for specific aspects of course
- Avoids performance critiques of instructor (not correlated with conceptual gain)
- Easily customized (15 min); available on-line through FLAG (hosted by University Colorado/Boulder)
- Very reliable (0.8 or better at UNM)
Scoring Rubrics

- **Makes** explicit goals and the criteria for their achievement
- **Provides** an accessible way to communicate goals
- **Consists** of set of scoring criteria, grouped in categories by level of performance
- **Applies** to any student performance (oral, written, portfolios), formative or summative
- **Demands** ample time for the develop, apply, and revise
Structured Interviews

- Probes “student thinking” & “natural language”
- Requires series of focused questions (set of tasks)
- Elicits in-depth portrait of students’ conceptual understanding; illuminates misconceptions
- Needs private space, interview protocol, props, recording equipment (and/or scribe)
- Demands ample time for the design, interviews, analysis, feedback
Attitude Surveys

- Perceptions about course, discipline.
- Seem easy to construct, but are not!
- Best based on a robust, field-tested model
- Usually have subscales for reliability check (overall require 0.65 or higher)
- Can be given pre/post to measure change in class as a whole
- Take little time (30 items < 10 minutes)
Classroom Assessment: Good News!

Well-done formative assessment results in a pre/post gain of about 0.5 standard deviation (70% rather than 50% on a “standardized” test)
Presentation Assessment

+ What is the most striking idea/concept of the presentation?

△ What one change would improve the presentation?
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[A Field-tested Learning Assessment Guide (FLAG) on the Web]

Introduction:
Do you believe that assessment drives learning? And that learning results in achievement? If yes, then the Web-based Field-tested Learning Assessment Guide (FLAG) can help you with field-tested, research-based assessments!

Description:
We will present information on the contents and use of a Web site that provides a Field-tested Learning Assessment Guide (FLAG) for science, mathematics, engineering, and technology (STEM) faculty. Though aimed at STEM classes, the techniques can be used in all disciplines. The FLAG includes a primer on assessment to bring faculty quickly up to speed on the key concepts of assessment and practical advice on getting started. Robust tools for adoption and adaptation are included.

Abstract:
Assessment drives learning. The research evidence supports this concept, especially for formative assessment aimed at improving student outcomes. But what is this process called “classroom assessment”? And how can busy faculty do it? The National Science Foundation (NSF) has supported the development of national resource that provides a Web-based Field-tested Learning Assessment Guide (FLAG) for science, mathematics, engineering, and technology faculty. Using a guide book as a model, the FLAG includes a selection of classroom assessment techniques (CATs) with enough background information to employ specific assessment tools. Each CAT has a strong empirical and research base; each CAT-aligned tool has been field-tested; all materials have been peer reviewed. The FLAG’s goal is to assist faculty to grow more reflective about student learning outcomes, and so improve them—enhance achievement!

References


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