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No One is Leaving Without You . . . or Me Knowing: Interactive Classroom Assessment Techniques (iCATs) Using Clicker Technology

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<http://webpages.sou.edu/~vidmar/onlinenw2013/vidmar.pptx>

Online Northwest 2013 Conference

Oregon State University

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The Existential Question: Why are We Here?

Why are We Here?

Learning Outcomes:

Participants will be able to:

- 1. Explain the pedagogical advantages of implementing clickers to improve teaching and learning.**
- 2. Differentiate formative on-going, collaborative assessment vs. summative periodic, high stakes evaluation activities.**
- 3. Develop interactive classroom assessment techniques to measure the “real-time” learning of students.**
- 4. Design “effective” questions to assess what you value implementing interactive classroom assessment techniques (iCATs).**

Where We are Going. . . .

Basic Schema:

- 1. Formative Assessment vs. Summative Evaluation**
- 2. Classroom Assessment Techniques – Thomas Angelo & K. Patricia Cross**
- 3. iCATs – interactive CATs**
- 4. Clicker Systems**
- 5. Why Bother**
- 6. Designing Effective Questions**
- 7. Some Example Questions**
- 8. Suggestions for Success**

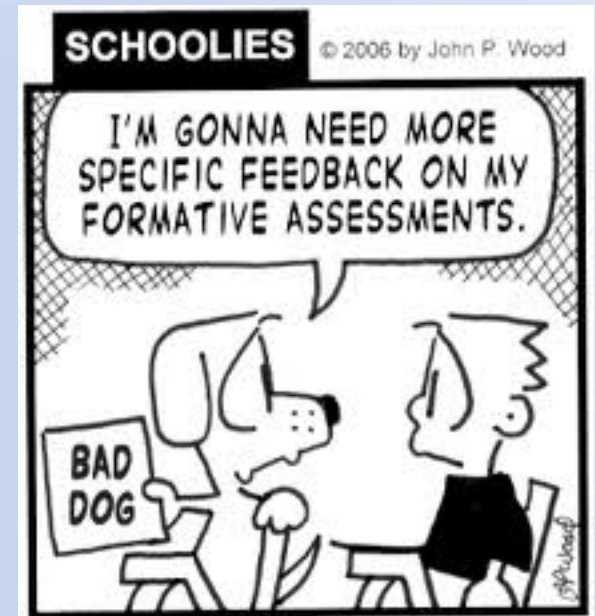
Formative Assessment

(continuous, self-improvement, growth, introspection, student achievement)

VS.

Summative Evaluation

(sporadic, high stakes, judgmental
“good” or “bad”, accountability)



Classroom Assessment Techniques

- Thomas Angelo and K. Patricia Cross

Classroom Assessment Techniques

iCATs

Angelo and Cross

<http://webpages.sou.edu/~vidmar/onlineenw2013/cats-outline.pdf>

Interactive Classroom Assessment Techniques (iCATs)

The following list of iCATs organized into two categories by Angelo and Cross (1993) provide a basic structure that can be adapted into Interactive Classroom Assessment Techniques (iCATs) designed to assess using student response systems or clickers.

Techniques for Assessing Course-Related Knowledge and Skills

- I. **Assessing Prior Knowledge, Ability, and Understanding** – Students measure prior knowledge and course.
1. Background Knowledge Probe – Students determine prior knowledge or experience by asking general questions.
2. Misconception Check – Students identify ideas or events important to the course.
3. Misconception/Preconception Check – Students determine prior knowledge or experience that may interfere with acquisition of new knowledge.
4. Entry Outlines – Students complete an idea or concept from limited or partial information.
5. Memory Match – Students recall information by filling in blanks.
6. Minute Paper – Students discuss two points: 1) Most important ideas learned and 2) Questions that remain unanswered.
7. Medders Pair – Students identify ideas or points that are still unclear to learn students acquire immediate information. This is often combined with the most important ideas learned from the minute paper.
- II. **Assessing Skill in Analysis and Critical Thinking** – Students understand the process or the “how-to” perform a procedure.
8. Categorizing Task – Students organize concepts into a structure such as, subdivide elements or larger concepts.
9. Defining Feature Matrix – Students categorize the presence or absence of important or relevant information.
10. Pro and Con Field – Students illustrate positive/neutral or advantages/disadvantages of an issue, idea, or method.
11. Causal, Policy, and Prediction Decisions – Students examine causal, policy, and prediction of analysis or method.
12. Analytic Memo – Students analyze specific problem or issue to clarify thoughts or decisions.
- III. **Assessing Skill in Synthesis and Creative Thinking** – Students form original thoughts or content from the synthesis of new information.
13. One-Sentence Summary – Students create a condensed summary of information in a brief statement.
14. Word Journal – Students summarize an idea in a single word combined with a rationale for choosing the word.
15. Appearance Analogies – Students complete second half of an analogy such as it is to this as it is to that.
16. Concept Maps – Students diagram connections and important concepts representing concepts of lesson.
17. Invented Dialogue – Students structure a dialogue that explores the essence of lesson.
18. Annotated Portfolios – Students construct examples that represent various of lesson.

IV. **Assessing Skill in Problem Solving** – Students determine aspect of a problem or idea and techniques necessary to the solution.

19. Problem Recognition Tasks – Students identify particular difficulties or issues associated with a problem or task.
20. What's the Principle? – Students identify general principles to solve specific situations or problems.
21. Documented Problem Solutions – Students describe steps or procedures taken to solve a problem.
22. Student and Video Record Problems – Students capture problems solving process and activities associated with the solution.
- V. **Assessing Skill in Application and Performance** – Students apply new information and learned principles.
23. Directed Paraphrasing – Students explain concepts or ideas from lesson demonstrating ability to translate highly specialized information.
24. Application Cards – Students generate examples of important principles, ideas, or procedures.
25. Student Generated Test Questions – Students compose questions and model answers for critical information.
26. Human Tabletop Class Modeling – Students transform concepts by physically modeling a process or idea.
27. Paper or Project Prospectus – Students develop brief plan to outline the structure to complete an assignment or project.

Techniques for Assessing Learner Attitudes, Values, and Self-Awareness

- VI. **Assessing Students' Awareness of Their Attitudes and Values** – Students examine attitudes, values, beliefs, and opinions as well as self-awareness.
28. Classroom Opinion Polls – Students compare and contrast ideas, beliefs, experience with others to discuss levels of similarities and differences.
29. Double Entry Journals – Students compare ideas and reactions to significant ideas or process and explain the personal significance.
30. Profiles of Admired Individuals – Students formulate a description of the characteristics or significant points of a person or process related to the lesson.
31. Everyday Ethical Dilemmas – Students illustrate ideas or solutions to a particular situation or problem that poses structural or ethical dilemmas.
32. Cause-related Self-Confidence Survey – Students answer questions measuring self-confidence as related to information or process related to the lesson.
- VII. **Assessing Students' Self-Awareness as Learners** – Students explore personal goals, interest, and style of learning.
33. Focused Anecdotal Sketches – Students describe successful learning experience related to the lesson.
34. Interest Knowledge/Skill Checklist – Students evaluate interest in various aspects of the lesson and indicate personal level of skill or knowledge in each aspect based on a checklist.
35. Goal Ranking and Reflecting – Students prioritize list of 5 goals and rank relative importance.
36. Self-Awareness Map of Learning – Students describe general approach to learning or preferred learning style.

VIII. **Assessing Course-Related Learning and Study Skills, Strategies, and Behaviors** – Assess for personal study and learning behaviors.

37. Productive Study Time Logs – Students indicate the time spent studying and indicate when the most beneficial times occur.
38. Productive/Ineffective – Students reflect on learning and attention at various intervals during lesson, then measure what helped or hindered their attention.
39. Process Analysis – Students describe the process or approach to completing a task or assignment.
40. Diagnostic Learning Logs – Students identify and diagnose difficulties or distractions to learning at lesson, then create possible solutions to these issues.

Techniques for Assessing Learner Reaction to Instruction

- IX. **Assessing Learner Reaction to Teachers and Teaching** – Students produce constructive feedback about issues to improve teaching.
41. Chain Notes – Students respond to a question about the level of engagement and involvement at a particular point in the lesson.
42. Electronic Survey Feedback – Students respond to a question or short series of questions about the effectiveness of the course.
43. Teacher Designed Feedback Forms – Students evaluate specific aspects and effectiveness of a particular class session.
44. Group Instructional Feedback Technique – Students assess the lesson in relation to these questions:
a) What worked? b) What did not? c) What could be done to improve the lesson?
45. Classroom Assessment Quality Circles – Students judge the engagement, ideas, assignments, or other aspects of a lesson in a formalized, analyzing interaction at regular intervals.
- X. **Assessing Learner Reaction to Class Activities, Assignments, and Materials** – Students estimate the value of activities, assignments, or other material related to the lesson.
46. Index Cards – Students summarize, question, connect and connect – Students recall and summarize meaningful points from lesson.
47. Group-Work Evaluation – Students evaluate group function to improve the process working together.
48. Reading Rating Sheets – Students rate the effectiveness of a reading, assignment, or activity.
49. Assignment Assessments – Students appraise the value of an assignment to their learning.
50. Team Evaluations – Students rate the value of learning occurring during the process of taking an exam or test as well as the overall fairness, appropriateness, and usefulness of the questions.

Metacognition

Higher order thinking involving:

- 1. Planning and Intention**
- 2. Monitoring Comprehension**
- 3. Assessing Progress**

Thinking about Thinking

Prior knowledge is critical to developing learning that is appropriate to what students already know and building upon that knowledge.

Interactive Classroom Assessment Techniques (iCATs)

- 1. Background Knowledge**
- 2. Misconception/Preconception**
- 3. Opinion Polls**
- 4. Self-Confidence Survey**
- 5. Check-In**
- 6. Activity Reactions/Assessment**
- 7. Assignment Ratings**
- 8. Review Materials**
- 9. Accentuate Important Points**

Audience Response Systems (Clickers)

Some Popular Clicker Systems:

1. Turning Technologies
2. Padgett Communications
3. Keypoint Interactive
4. QClick
5. Poll Everywhere
6. Clicker School
7. iRespond
8. Socrative
9. SMSPoll



Audience Response Systems (Clickers)

Why bother?

Research evidence suggests clickers increase student learning.

- Pre- and post-test scores of 200 students determined student learning was the lowest when students did not have clickers (Buhay, Best, and McGuire, 2010).
- When clickers were used during varying intervals during class, students were better able to recall factual information. In addition, questions often alerted students to important information (Shapiro & Gordon, 2012).

Audience Response Systems (Clickers)

Why bother?

- 1. Assess Prior Knowledge**
- 2. Promote Interactivity/Participation**
- 3. Elicit Diverse Points of View**
- 4. Maintain Attention**
- 5. Emphasize Major Ideas**
- 6. Clarify Misconceptions**
- 7. Ensure Understanding**
- 8. Improve Teaching and Learning**
- 9. Enhance the Learning Experience**

Audience Response Systems (Clickers)

Why bother?

Research evidence suggests clickers increase nonconformity and willingness to respond.

- Two groups of students (128 total) asked to respond to 50 controversial questions. Control group responded by a show of hands. Experimental group responded with clickers. Study concluded students with clickers responded with greater variability and were more comfortable answering the questions (Stowell, Oldham, & Bennett, 2012).

Clicker Satisfaction

Summary of Study Criteria

Criterion	Number of Sample	Significant Postive Outcomes
Actual performance	34	22
Satisfaction	47	46
Perceived performance	37	35
Attention span	25	23
Participation	21	20
Feedback	15	15
Ease of use	8	8

Keough, S. M. (2012) Clickers in the classroom: A review and a replication.
Journal of Management Education, 36(6), 822-847.

Designing “Effective” Questions

1. Assess what you value.
2. Keep it simple.
3. Avoid double negatives.
4. Details belong in the question, not the answer.
5. Maintain consistent language.
6. At all cost, avoid “all of the above” or “none of the above.”
7. At all cost, avoid “a and b, b and c, or a and c.
8. Share and discuss questions with colleagues. Take time to reflect.

Suggestions for Success

- 1. Use clickers to further class objectives.**
- 2. Make time to integrate clickers.**
- 3. Be prepared and have a Plan B.**
- 4. Increase your creativity along with your experience.**
- 5. Provide students with rationale of use.**
- 6. Avoid too many questions—better to have 4-5 questions at well placed intervals during 50 minutes.**
- 7. Revert back to a show of hands to gain a full appreciation of clickers.**

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