# ARE THEY GETTING WHAT I THINK I'M TEACHING?!

## CLASSROOM ASSESSMENT TECHNIQUES

## (CATs)

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**CLASSROOM ASSESSMENT
TECHNIQUES**

**"CATs"**



"Classroom Assessment is an educational innovation that unites efforts to improve both teaching and learning. Classroom Assessment also involves students in active mental processing of new information and makes them more aware of themselves as a learner" (Steadman 23).

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# ASSESSMENT IS . . .

> The systematic collection, examination, and interpretation of qualitative and quantitative data about student learning and the use of that information to document and improve student learning (Higher Learning Commission/North Central Association).

Assessment is a process that occurs at various levels of the institution in higher education. Although the procedure is essentially the same at each level, the outcome question, methods and interested parties vary.

➔ **The college** – Institutional Effectiveness.
At the institutional level, the emphasis is broad as reflected in the key outcome question: *Does the College fulfill its stated mission?*

➔ **The program** – Program Review.
The program review process at LCC is called Program Quality Improvement Process (PQIP). The key outcome question asks: *Are we improving student success through a framework of positive change?* More specifically we wonder: *Are graduates or program completers prepared for employment and/or for pursuing advanced course work, etc.?*

➔ **The course level** – Assessment of Learning Outcomes.
The outcome question is: *Are students learning what faculty intend for them to learn in the course, i.e., upon completion of the course, have students acquired the skills, attitudes, and competencies that were intended?* Assessment is often mistakenly equated with the course grade.

➔ **The class** – Classroom Assessment.
The typical question addressed at the classroom level is: *Did my students learn what I intended for them to learn today?* Classroom-level assessment, as promoted by Cross and Angelo through the use of Classroom Assessment Techniques (in their book by the same name or the acronym, CATs), is an approach that reveals to individual college teachers *what*, *how much*, and *how well* their students are learning in time to remedy gaps in knowledge or understanding. CATs are excellent examples of formative assessment strategies and are based on the assumption: "The best way to improve learning is to improve teaching" (Huba and Freed 124).

> **The emphasis on student learning is what happens at the classroom level, and "it is fundamental to the success of all other levels of a community college"** (Wilson 5).

# ASSESSMENT AND EVALUATION:

# SIMILAR METHODS, DIFFERENT INTENTS

While many educators use the words evaluation and assessment interchangeably, these concepts have different definitions and purposes. Evaluation refers to "judging the value of evidence based on definite criteria" (Palomba and Banta 28) and typically results in a grade. Defined previously in these materials, assessment refers to the collection and interpretation of data about student learning, and then using that information to both document and improve student learning.

"Obviously there is a great deal of overlap between the tasks of grading (evaluation) and assessment, as both aim to identify what students have learned [but] grades alone do not usually provide meaningful information on exactly what students have or have not learned" (Suskie 10).

The comparison below distinguishes some key differences between the two concepts:

| EVALUATION | ASSESSMENT |
|---|---|
| 1. is focused on the individual student. | 1. is focused on an aggregate of students. |
| 2. is done, primarily, to assign grades (although some may use results to make changes in the curriculum). | 2. is done, primarily, to improve student learning. |
| 3. results in a grade that is often used outside the college for selection purposes, e.g., whom to hire, whom to admit to a course of study, etc. | 3. results are primarily for the institution's internal use to improve student learning and student academic achievement. |

# CLASSROOM ASSESSMENT IS . . . . .

**"An approach [developed by Thomas Angelo and K. Patricia Cross] designed to help teachers find out what students are learning in the classroom and how well they are learning it"** (4).

Classroom assessment, as popularized by Cross and Angelo, has the following characteristics. It is:

◆ <u>learner-centered</u>. Classroom assessment is designed to be used between teaching and testing to find out how well students are doing in time to help them improve.

◆ <u>teacher-directed</u>. Because classroom assessment occurs in instructors' classrooms, faculty members make all the choices about implementation, including how to handle the results.

◆ <u>mutually beneficial for the learner and the faculty member</u>. Both parties are more aware of the learning that is – or perhaps is not – taking place.

◆ <u>formative</u>. The main purpose of classroom assessment is to improve learning in progress by providing teachers with feedback on their teaching effectiveness and student comprehension. Daily instructional decisions can be changed. Students can be provided with information that can help them learn more effectively.

◆ <u>context-specific</u>. The CAT a faculty member chooses is selected, designed and used for a specific class for the benefit of that class.

◆ <u>on-going</u>. By their nature, CATs encourage a continuous feedback loop.

◆ <u>firmly rooted in good practice</u>. Classroom assessment techniques enhance student learning by:
  o focusing attention,
  o encouraging deep processing and connecting it to other information from the learner's background, and
  o encouraging metacognition, i.e., thinking about learning and thinking.

The primary goal of classroom assessment is to better understand your students' learning and to improve your teaching.
(Cross and Angelo 4-6)

# ANGELO'S SEVEN AXIOMS OF
# CLASSROOM ASSESSMENT

1. Ask only if you want to know.

2. Ask students for feedback only if you can and will respond to it.

3. Collect only data that you can easily and quickly turn into information.

4. Adapt methods to fit your class rather than simply using methods and techniques from others. It is important for the learning activity, the learning outcome and the assessment (the CAT) to be aligned.

5. Ask first: Which technique is appropriate to answer your questions, not which questions are appropriate to fit the assessment technique.

6. Determine: How will knowing the answer to these questions help improve student learning? (If you can't answer this question, the assessment is probably not worth doing.)

7. Keep in mind: If an assessment is worth doing, it's worth teaching students how to engage in the process in a meaningful way. (Angelo 11)

# CHARACTERISTICS OF CLASSROOM ASSESSMENT TECHNIQUES

Whereas Classroom Assessment is a systematic approach to formative evaluation of student learning, Classroom Assessment Techniques (CATs) are the tools. CATs have the following characteristics.

1. Typically non-graded, anonymous, in-class activities.

2. Feedback devices that enable you to discover how much, how well, and what your students are learning.

3. Pre-designed activities which permit you to get immediate and useful answers to focused questions you have about your students' learning.

4. Supplement and complement formal evaluation/assessment of learning.

5. Encourage a systematic way of continuously conducting informal assessment.

6. Flexible and variable, with some being easier to administer or respond to than others.

7. Vary in their range of complexity.

8. Provide either quantitative or qualitative data.

9. Encourage faculty to become more systematic and sensitive observers of learning as it occurs in their classrooms on a daily basis (Cross and Angelo 25-32).

# SUGGESTIONS FOR SUCCESSFULLY
# USING CATs

1. Decide what you want to learn from a classroom assessment.

2. Use CATs that appeal to your intuition and judgment. There are fifty CATs described in Cross and Angelo's book. Some will appeal to you more than others.

3. Start small. Five of them have been promoted as excellent "introductory" CATs because each is flexible and adaptable, as well as simple and quick to apply. These CATs are listed below and directions for using them follow on the next several pages.
   - The Minute Paper
   - The Muddiest Point
   - The One-Sentence Summary
   - Directed Paraphrasing
   - Application Cards

4. Be aware that many of the CATs can be converted for use in an online class. Check the section entitled, CATs and Online Courses, in the resources section at the end of this document.

5. Try the CAT on yourself or a colleague, before your students, to make sure it works the way you think it will.

6. Allow sufficient time in your class schedule to conduct these assessments. Time is needed for explaining the purpose, conducting the CAT, and then providing feedback to your class about the results.

7. Be sure to close the communication loop. Once you've shared what you learned from the CAT, discuss how both you and your students can use the information to improve your teaching and their learning (Cross & Angelo 25-32).

# HOW TO USE MINUTE PAPERS

## Description:
"A one-minute paper can serve as a 'cool-down.' It helps students absorb, digest, and internalize new material, moving it into long-term memory. It also makes them think about the material, especially what they didn't understand, which is precisely what you need to know before wrapping up a topic" (Nilson 168-9).

Minute Papers are undoubtedly the most used of all the CATs. They yield a great deal of information about student learning without a great deal of effort from the faculty. Minute Papers are particularly useful when assessing:

- "student recall and understanding.
- student evaluation of what they recall.
- student ability to self-assess their learning and understanding" (Strassen 25).

## Directions:
- Have your students take a few minutes at the end of a class to respond to one or two questions, based on what you would like to discover about your students' learning at this point in time. As you get more skilled, try new questions such as those found on the next page in this document.

- Have students submit their responses anonymously.

- Begin the next class by summarizing the most important learnings and addressing students' questions.

- Discuss possible courses of action.

## The Questions:
1. What is the most important thing you've learned in this session?
2. What important question remains unanswered?

# VARIATIONS ON THE "ONE MINUTE" THEME!

As you become more experienced using CATs, such as the "One Minute Paper," you may find that you want to ask other questions and/or get other types of information from your students. Below are some suggestions for quick feedback written by other faculty.

1.  What is the most significant thing you learned today?

2.  What question is uppermost in your mind?

3.  Jot down three or four key concepts or main ideas from today's class.

4.  How can I help you understand the concept that is giving you the most difficulty?

5.  Do I stay on the topic?

6.  How are the questions asked during class contributing to your learning?

7.  What did you learn today that you think is totally unimportant?

8.  What mannerisms do I have that interfere with your learning?

9.  Complete the following statement: An application of _____ is _____ because _____ .

10. Am I using enough examples?

11. What did you learn today that you will use/apply?

12. Which material from this course do you think will be important to you both now and later in your life?

13. What changes would you suggest I make in the course material for next semester?

# HOW TO USE THE MUDDIEST POINT

**Description:**
"Perhaps the easiest CAT to implement, you can use it [the Muddiest Point] on the spur of the moment. Struggling students who are not comfortable asking questions publically [about material they find confusing] find it to be a lifeline. In addition, it enables you to see the material through your students' eyes, reminding you of the many different ways they process and store information. Finally, knowing that they will have to identify a muddy point induces students to pay closer attention in class" (Nilson 276).

**Directions:**
1. Ask your students to write down what they found to be the most confusing point in _____ i.e., the lecture, an assigned reading, a demonstration

2. Collect the responses which can be submitted anonymously.

3. Clarify the areas of confusion at the start of the next class.

# HOW TO USE THE ONE-SENTENCE SUMMARY

## Description:
"This technique makes students distill, simplify, reorganize, synthesize, and chunk complex material into smaller, essential units that are easier to manipulate and remember. It is advisable that you do the exercise first before assigning it and allow twice as much time as it takes you. You can collect and comment on the summaries yourself or have your students exchange them and write comments on each others" (Nilson 169).

## Directions:
Ask students to summarize the information they just heard in the _____ (lecture, reading assignment, etc.).

To do this, the following prompts may prove helpful:

- ✓ Who?
- ✓ Does what?
- ✓ To what or whom?
- ✓ When?
- ✓ Where?
- ✓ How?
- ✓ Why?

(Nilson 169)

The summary sentence is:

# HOW TO USE DIRECTED PARAPHRASING

## Description:
"In their own words, students summarize the content of a reading assignment, a lecture, a discussion, or a lab to a defined audience for a specific purpose.

Because students must paraphrase material, they must work to understand it in depth and internalize it. Also, since they are writing to a specific audience, they must consider the informational, persuasive, and political value of the available knowledge and data – for example, what facts and arguments are important or irrelevant to a given audience" (Nilson 170).

## Directions:
In writing, have students explain in their own words a concept, part of a lesson, or a homework assignment/reading, etc., for a specific audience or purpose.  For example: A nursing student might be directed to paraphrase the concept of drug clearance by the kidneys to a worried patient.

After collecting this written work, the instructor can create perhaps four response categories, such as novice, adequate, developed, and exceptional. The responses are then evaluated and placed under the level they describe. Ultimately the responses are examined within and across the four evaluative categories for accuracy, suitability for the intended audience, and effectiveness in fulfilling the assigned purpose (Cross and Angelo 232-235).

# HOW TO USE APPLICATION CARDS

**Description:**
"This CAT gives students practice in transferring knowledge to useful applications" (Nilson 277).

**Directions:**

1.  After discussing an important principle, concept, theory or procedure, ask students to take a moment to write down on an index card at least one real-world application for what they just learned.

2.  Give them three to five minutes, and then collect the index cards.

3.  During the next class session, share two or three of the best applications.

# CHALLENGES WHEN USING CATS ONLINE

CATs can be easily amended for online courses with the use of various web based tools such as: blogs, wikis, and backchanneling which work as follows:

"Blog: a discussion or informational site published on the www and consisting of discrete entries typically displayed in reverse chronological order. Until 2009 blogs were usually the work of a single individual, occasionally of a small group, and often were themed on a single subject."

"Wiki: a website which allows its users to add, modify, or delete its content via a web browser usually using a simplified markup language or a rich text editor."

"Backchannel: the practice of using networked computers to maintain a real-time, online conversation alongside live spoken remarks" *(Wikipedia).*

Despite these tools, it is important to keep a few things in mind so that the experience is beneficial for faculty and students. It is likely that:

- ✓ Extrinsic motivators, such as giving a few extra points for participating, may need to be awarded to ensure that students complete the CATs.

- ✓ Additional time may be needed for completing CATs.

- ✓ Consideration may need to be given to the fact that students are in different stages of the course.

- ✓ Courses may need to be more structured and sequenced to properly use CATs.

- ✓ Students do not experience the same learning environment; therefore, responses to questions may be or may seem incongruent (Mangieri)

# IF YOU'RE FAILING TO PLAN. . .

There is a tenet in time management literature that says: If you're failing to plan, you're planning to fail. Therefore, it is important to determine in advance what you want to learn from engaging in Classroom Assessment. After establishing your goal, you should inform your students about the purpose of the activity – and then do it!!

Additionally, you may find a planning worksheet, such as the one below, useful.

## CLASSROOM ASSESSMENT PLANNING WORKSHEET

1. What do you want to know?

2. Which CAT will you use to get this information?  Why that CAT? OR Will you create your own classroom assessment method? Please describe it.

3. How will you introduce this technique to your students?

4. How much class time do you think it will take?

5. What changes will you make as a result of the information you receive? (Answer this after the results have been shared with the class, and you've had time to reflect on different options.)

6. How will you know if you've been successful? (Answer this after you've implemented any changes.)  ("Applying Classroom Assessment Techniques" 4).

# WHAT DO YOU DO WITH THE DATA
# ONCE YOU HAVE IT?

Once you have collected your data (One Minute responses, Muddiest Point responses, etc.), it is time to begin your analysis. Through this process, you are trying to discern what the data tells you and beginning to consider what to do with the results. This step requires using either quantitative methods (counting; perhaps statistical manipulation, etc.) or qualitative methods. In the latter case, you are attempting to understand the meaning of the responses to the open-ended questions. When the sorting is complete, you might find it helpful to organize your information in some way -- perhaps like the chart below with sample information filled in.

## BACKGROUND KNOWLEDGE ORGANIZATION CHART

| Assessing What? | Assessment Method | Type of Data Collected | What Do the Results Say? | How Will You Respond to the Results? | Any Surprises? |
|---|---|---|---|---|---|
| | | | | | |
| Student knowledge of course content prior to beginning the course. | Student Background Knowledge Problem.<br><br>(CAT #1) | Quantitative survey data and open-ended responses. | 60% of the students have some pre-knowledge; 40% have none. | Challenge those who have background knowledge; bring those who don't up to speed. | I thought more students would already know the information I asked about.<br><br>(Stassen 44) |

As you continue the task of transforming your raw data into useable information, Cross and Angelo offer the following questions about student learning for your consideration and discussion:

1. "How many students are learning well; how many are not?
2. Which students are learning well; which are not?
3. What do successful learners do that other learners don't do **OR** don't do as well?
4. How much of the course content are students learning?
5. How well are students integrating the various elements of the course content?
6. How does my teaching affect student learning – positively and negatively?
7. What, specifically, could I change about my teaching to improve learning inside and outside the classroom?"

Remember: Knowing WHY you are assessing is key to deciding what to do with the data after you collect it" (43).

# REAPING THE BENEFITS OF CLASSROOM ASSESSMENT

## BENEFITS TO FACULTY

1. The ability to tune into students' voices, thus having more satisfied students.

2. The opportunity to engage in reflection and systematic changes in the classroom.

3. Student improvement and involvement in their learning.

4. The opportunity to join a community of other faculty who are committed to teaching and using CATs.

5. In sum, faculty find Classroom Assessment intrinsically rewarding. They like being able to implement CATs according to their individual goals, interests and time available for planning and analysis (Steadman 26-27).

## BENEFITS TO STUDENTS

1. Like faculty, students experience increased control and voice in the classroom. Classroom assessment can increase student satisfaction.

2. Students are more involved in their own learning.

3. Student feedback to faculty about their teaching benefits the students. Again, increasing student satisfaction.

4. Students improve their metacognitive abilities and their ability to monitor their own progress.

5. Students have an opportunity to identify areas for further study and review, as well as alter their study skills if necessary (Steadman 30-31).

# CLASSROOM ASSESSMENT TECHNIQUES:  A HANDBOOK FOR COLLEGE TEACHERS (2$^{nd}$ EDITION) –

## An Invaluable Resource

Cross and Angelo's Handbook is an invaluable resource.  The authors write, "This is a practical handbook, designed for easy reference and for readers with varied levels of experience with Classroom Assessment" (xv).  Some of the key features of the book are described below. It includes:

■ A "Teaching Goals Inventory" a survey to identify and rank the relative importance of faculty teaching goals according to six categories, (20-22)

■ "A Checklist for Avoiding Problems with CATs" (59)

■ Three indexes for finding CATs
      1.  alphabetical index, (109)
      2.  examples by discipline, (110-112)
      3.  categorizing by Teaching Goals, (113-114)

■ The Classroom Assessment Techniques, (121-361). The format for each of the fifty CATs includes thirteen or fourteen of the elements listed below:
    1.  Name and number of the CAT.
    2.  Estimation of time and energy required for its use.
    3.  Description of the technique.
    4.  Purpose of the technique.
    5.  Related Teaching Goals.
    6.  Some suggestions for using the CAT.
    7.  Examples of ways it has been used by others.
    8.  Step-by-step directions.
    9.  Suggestions for analyzing the feedback collected.
    10. What to do after the analysis.
    11. Benefits of the CAT.
    12. Drawbacks of the CAT.
    13. Cautions about the CAT.
    14. Additional references and resources when applicable.

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# CLASSROOM ASSESSMENT TECHNIQUES: RESOURCES FROM THE WEB

## CATs for ONLINE COURSES

**Applying Classroom Assessment Techniques in the Online Class**
http://www.bemidjistate.edu/its/elearning/resources/assessment_evaluation/files/assess-class-PPT.pdf

**Classroom Assessment Techniques at Rochester Institute of Technology**
http://www.rit.edu/academicaffairs/outcomes/classroom.php

**Classroom Assessment Techniques for Online Courses: Techniques for Assessing Course--Related Knowledge and Skills**
http://blendedcoursedesign.pbworks.com/f/CATS-Online.pdf

**Classroom Assessment Techniques in Asynchronous Learning Networks**
http://technologysource.org/article/classroom_assessment_techniques_in_asynchronous_learning_networks/

**Designing Principles for Creating Effective Web-Based Learning Resources in the Geosciences**
http://serc.carleton.edu/NAGTWorkshops/webdesign/assessment_techniques.html

**Field-Tested Learning Assessment Guide: Classroom Assessment Techniques (CATs)**
http://www.flaguide.org/cat/cat.php

**Online Assessment Strategies: A Primer**
http://jolt.merlot.org/vol6no1/sewell_0310.pdf

**Technology-Enhanced Classroom Assessment Techniques**
http://www.facultyfocus.com/articles/online-education/technology-enhanced-classroom-assessment-techniques/

**What are the Conditions of Excellence in Education?**
www.powerpointviewer.net/ppt_assessment_techniques.html

## CATs in GENERAL

**An Assessment Framework for the Community College**
http://www.league.org/publication/whitepapers/files/0804.pdf

**Applying Classroom Assessment Techniques**
http://www.lanecc.edu/fpd/documents/htclassassess.pdf

**Assessment and Outcomes: Best Practices in Teaching and Learning**
http://pandora.cii.wwu.edu/cii/resources/outcomes/best_practices.asp

**Assessment as Feedback**
http://www.newhorizons.org/strategies/assess/wiggins.htm

**Assessment as a Tool for Learning**
http://www.newhorizons.org/strategies/assess/hearne.htm

**CAT FAQs**
http://www.bartonccc.edu/administration/iss/assessment/catfaqs.html

**Classroom Assessment**
http://fcit.usf.edu/assessment/

**Classroom Assessment Technique Reporting Form**
https://spreadsheets.google.com/viewform?formkey=dDk2Z2RKdXNXbTdmQ2NaekFDTHo2OXc6MQ

**Classroom Assessment Techniques**
http://www.ntlf.com/html/lib/bib/assess.htm

http://frank.mtsu.edu/~itconf/proceed99/Martin.htm
**Classroom Assessment Techniques Designed for Technology**

**Course-based Review and Assessment**
http://www.umass.edu/oapa/oapa/publications/online_handbooks/course_based.pdf

**Effective Assessment**
http://tep.uoregon.edu/resources/assessment/

**Faculty Resources Quick Tip – Classroom Assessment Techniques**
http://www.park.edu/cetl/quicktips/classroomassess.html

**Student Assessment**
http://www.utc.edu/Administration/WalkerTeachingResourceCenter/FacultyDevelopment/Assessment/assessment.html

**Teaching Tips: Classroom Assessment Techniques**
http://tlc.eku.edu/tips/classroom_assessment/

**Using Classroom Assessment to Change both Teaching and Learning**
http://www.sdbor.edu/services/studentaffairs/documents/UsingClassroomAssessmenttoChangeBothTeaching-Learning.pdf

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## MISSION of the CWAC:

The College -Wide Assessment Committee (CWAC) exists to promote a comprehensive and systematic approach to assessment of student learning that uses data and information about student success to improve instruction and learning experiences as well as achievement of learning outcomes.

The CWAC strives to institutionalize a continuous improvement process by:
- gathering comprehensive information about assessment of student learning through a documented college process.
- identifying successful assessment strategies.
- sharing assessment updates with the college community.
- guiding assessment improvement initiatives to increase student success.

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