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### CAT Examples

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## Descriptions of Selected Classroom Assessment Techniques

Name	Description	What to Do with the Data	Time Required	CAT #
Misconception/ Preconception Check	The Misconception/Preconception Check focuses on uncovering students' prior knowledge or beliefs that may hinder learning. Brainstorm a list of common misconceptions with a colleague or search the Internet. Write questions, create a short story with alternative explanations or use props. Ask students to explain and justify a response. Think through how you will respond to likely responses.	Look for answers to: What specific misconceptions or preconceptions do students have? How many students have them? How deeply entrenched are these 'problematic' ideas or beliefs? Sort the responses into categories by misconception or preconception and tally them. <i>Caveat:</i> Changing students' ideas is difficult and takes time.	Prep: Low In class: Low Analysis: Low <i>Caveat: Changing students' ideas is difficult and takes time.</i>	3
Course-Related Self-Confidence Survey	This survey measurements student's self-confidence related to a skill or ability in a specific course. First identify skills or abilities important to success. Create a survey to measure students' self-confidence and administer the survey in class. Best used before skills are introduced, and as a post-assessment. Easy to use in large classes.	Summarize the data by tallying responses. In small groups, ask student to discuss the data and to suggest ways to build competence and confidence.	Prep: Low In class: Low Analysis: Low	32
Pro and Con Grid	Focus on a decision, judgment, dilemma or current issue with implications in your discipline. Write a prompt that will elicit thoughtful pros and cons on the topic. Create your own grid. Have students jot down a list of pros and cons to help them think clearly about decision, judgment, dilemma or issue.	List the pros and cons students submitted and do a frequency count. Compare the students' points to yours. Have they omitted some points you expected? Have they included others you regard as unimportant? How balanced are the two sides? Report on and discuss results with the class.	Prep: Low In class: Low Analysis: Low-Med.	10
Problem Recognition	Choose examples of different but related problem types students find difficult to distinguish. Each example should illustrate only one type of problem. Try out examples on a colleague or advance student and make up short Problem Recognition Task handout. Students are asked to identify the problem type and not to solve the problem.	Scan the responses and tally the number of correct and incorrect responses. Ask student to what distinguishes one problem from another. How would an expert distinguish between the examples? <i>Caveat:</i> Just because students can correctly identify a problem does not mean they can solve the problem.	Prep: Mod.-High In class: Low Analysis: Low	19
Categorizing Grid	Select 2 or 3 categories useful for organizing information about a concept or idea. Make a list of good examples. Review the list to ensure items belong in only one category. Make a grid. Give students a scrambled list or use real object or pictures.	Check to see if students placed the right items in the correct boxes. Note items that are miscategorized or omitted. Look for patterns in the errors or for categories which are most difficult for students.	Prep: Mod. In class: Low Analysis: Low	8
Documented Problem Solutions	Select 1-3 representative problems students have been studying. Solve the problem(s) yourself and write down all the steps you took—note time it took. If too long or complicated, revise or replace problems—should take 30 minutes or less because it will take students at least twice as long. Hand out problems and explain process, making it clear this is not a test or quiz.	If teaching a large number of students, select only a few responses to analyze. Quickly skim all responses then select 3 correct responses with well documented solutions and 3 that are also well documented but incorrect. Compare the two sets and identify where the thinking error occurs.	Prep: Low In class: Low Analysis: Low	21
Concept Map	Select the concept and write down terms and phrases related to the "stimulus." Place stimulus at the top of the page or in the center and add major concepts. Add secondary and tertiary associations. Draw connections, adding connecting words where appropriate. Give students the stimulus and have them create their own concept maps.	Compare your concept map to that of students. Consider the content and types of relations between concepts identified by students. The data can be coded in a matrix that juxtaposes degree of relationship with type of relationship.	Prep: Low In class: Low Analysis: Low-Mod.	16

Name	Description	What to Do with the Data	Time Required	CAT #
Minute Paper	During the last few minutes of the class period, ask students to answer on a half-sheet of paper: “What is the most important point you learned today?”; and, “What point remains least clear to you?” The purpose is to elicit data about students’ comprehension of a particular class session.	Review responses and note any useful comments. During the following class periods emphasize the issues illuminated by your students’ comments.	Prep: Low In class: Low Analysis: Low	6
Chain Note	Students pass around an envelope on which the teacher has written one question about the class. When the envelope reaches a student he/she spends a moment to respond to the question and then places the response in the envelope.	Go through the student responses and determine the best criteria for categorizing the data with the goal of detecting response patterns. Discussing the patterns of responses with students can lead to better teaching and learning.	Prep: Low In class: Low Analysis: Low	41
Memory Matrix	Students fill in cells of a two-dimensional diagram for which instructor has provided labels. For example, in a music course, labels might consist of periods (Baroque, Classical) by countries (Germany, France, Britain); students enter composers in cells to demonstrate their ability to remember and classify key concepts.	Tally the numbers of correct and incorrect responses in each cell. Analyze differences both between and among the cells. Look for patterns among the incorrect responses and decide what might be the cause(s).	Prep: Med In class: Med Analysis: Med	5
Direct Paraphrasing	Ask students to write a layman’s “translation” of something they have just learned—geared to a specified individual or audience—to assess their ability to comprehend and transfer concepts.	Categorize student responses according to characteristics you feel are important. Analyze the responses both within and across categories, noting ways you could address student needs.	Prep: Low In class: Med Analysis: Med	23
One-Sentence Summary	Students summarize knowledge of a topic by constructing a single sentence that answers the questions “Who does what to whom, when, where, how, and why?” The purpose is to require students to select only the defining features of an idea.	Evaluate the quality of each summary quickly and holistically. Note whether students have identified the essential concepts of the class topic and their interrelationships. Share your observations with your students.	Prep: Low In class: Med Analysis: Med	13
Exam Evaluation	Select a type of test that you are likely to give more than once or that has a significant impact on student performance. Create a few questions that evaluate the quality of the test. Add these questions to the exam or administer a separate, follow-up evaluation.	Try to distinguish student comments that address the fairness of your grading from those that address the fairness of the test as an assessment instrument. Respond to the general ideas represented by student comments.	Prep: Low In class: Low Analysis: Med	50
Application Cards	After teaching about an important theory, principle, or procedure, ask students to write down at least one real-world application for what they have just learned to determine how well they can transfer their learning.	Quickly read once through the applications and categorize them according to their quality. Pick out a broad range of examples and present them to the class.	Prep: Low In class: Low Analysis: Med	24
Student-Generated Test Questions	Allow students to write test questions and model answers for specified topics, in a format consistent with course exams. This will give students the opportunity to evaluate the course topics, reflect on what they understand, and what are good test items.	Make a rough tally of the questions your students propose and the topics that they cover. Evaluate the questions and use the goods ones as prompts for discussion. You may also want to revise the questions and use them on the upcoming exam.	Prep: Med In class: High Analysis: High (may be homework)	25

This page only is from Indiana University’s Center for Innovative Teaching & Learning at <http://citl.indiana.edu/resources/teaching-resources1/sampleCATs.php>

Source: Angelo, T.A. & Cross, K.P. (1993). *Classroom Assessment Techniques: A Handbook for College Faculty*. San Francisco, CA: Jossey-Bass

## Examples CAT Applications

### Analytical Memos #12

- Description:** Simulation exercise that asks students to write a memo to an employer, client or stakeholder addressing an issue or problem
- Example: Environmental Studies**—after a story on contaminated ground water in a local newspaper, a professor gave students 3 days to write a memo to find out if they could analyze a typical environmental policy problem. She used a checklist to assess the memos.
- To Create:** Decide which analytical method or technique to assess and locate/invent a typical problem or situation for students to analyze. Specify who is writing the memo, who will receive it, subject & purpose.



Source: Angelo, T.A. & Cross, K.P. (1993). *Classroom Assessment Techniques*. San Francisco, CA: Jossey-Bass, pp. 177-181.

### Approximate Analogies #19

- Description:** Students complete second half of an analogy — A is to B as X is to Y— for which you have supplied the first half
- Examples:**
  - Physics**—Voltage is to wattage as \_\_\_\_ is to \_\_\_\_.
  - Freshman Comp**—The theme is to an essay as \_\_\_\_ is to \_\_\_\_.
  - Japanese**—Honorifics are to the Japanese language as \_\_\_\_ is to \_\_\_\_.
- To Create:** Select key relationship or concept students need to understand. Generate several “everyday” examples of analogies, then present 1-2 & ask student to complete 1-2 on their own. For the assessment, give “A is to B” portion of the analogy you want students to complete.



Source: Angelo, T.A. & Cross, K.P. (1993). *Classroom Assessment Techniques*. San Francisco, CA: Jossey-Bass, pp. 193-195.

### Categorizing Grid #32

- Description:** Paper & pencil equivalent of sorting objects into a bin—gives instructor snapshot of students’ “sorting rules”
- Example: Education**—after learning about schools of educational philosophy & how they were enacted in schools, students categorized pictures of classrooms:



Perennialism	Progressivism	Existentialism

- To Create:** Select 2 or 3 categories useful for organizing info. Make list of good examples. Review list to ensure items belong in only one category. Make a grid. Give students scrambled list or use real object or pictures.

Source: Angelo, T.A. & Cross, K.P. (1993). *Classroom Assessment Techniques*. San Francisco, CA: Jossey-Bass, pp. 160-162.

### Documented Problem Solutions #21

- Description:** Students keep track of steps they take in solving a problem
- Example: Linguistics** instructor assigns diagram of a sentence with multiple relative clauses & adverbial phrases. Students keep track of each step of diagramming.
- To Create:** Select 1-3 representative problems students have been studying. Solve problem yourself & write down all the steps you took—note time it took. If too long or complicated, revise or replace problems—should take 30 minutes or less (will take students twice as long). Hand out & explain process making it clear this is not a test or quiz.



Source: Angelo, T.A. & Cross, K.P. (1993). *Classroom Assessment Techniques*. San Francisco, CA: Jossey-Bass, pp. 222-224.

## Memory Matrix

#5

- **Description:** Rectangle divided into labeled rows & columns used to organize info & illustrate relationships.
- **Example: Art—Major Artists & Styles**

	France	United States	Britain
Neoclassicism			
Impressionism			
Postimpressionism			
Expressionism			

- **To Create:** Draw simple matrix & label headings. Fill in cells yourself, using same vocabulary from lectures & readings—check for good fit. Leave cells empty on student matrix.

Source: Angelo, T.A. & Cross, K.P. (1993). *Classroom Assessment Techniques*. San Francisco, CA: Jossey-Bass, pp. 143-145.

## Misconceptions/Preconception Check

#3

- **Description:** Focus is on uncovering prior knowledge or beliefs that may hinder or block further learning
- **Example:** Chemistry—in preparation for the next class on changing states of matter, an instructor boils water in a beaker and asks students "What's in the bubbles?"
- **To Create:** Brainstorm a list of common misconceptions with a colleague or search the Internet. Use props or create a short story with alternative explanations. Require students to select an explanation and to justify it. Think through how you will respond to likely student responses.



Source: Angelo, T.A. & Cross, K.P. (1993). *Classroom Assessment Techniques*. San Francisco, CA: Jossey-Bass, pp. 133-135.

## Problem Recognition

#15

- **Description:** Students presented with examples of common problem types & asked to identify type.
- **Example: Intermediate Statistics** students given five word problems adapted from intro course final exam & asked to specify what kind of statistical procedure would best solve each.



- **To Create:** Choose examples of different but related problem types students find difficult to distinguish. Each example should illustrate only one type of problem. Try out examples on a colleague or advance student & make up short Problem Recognition Task handout.

Source: Angelo, T.A. & Cross, K.P. (1993). *Classroom Assessment Techniques*. San Francisco, CA: Jossey-Bass, pp. 214-216.

## Self-Confidence Survey

#32

- **Description:** Measurement of student's self-confidence related to a skill or ability.
- **Example: Physical Education**  
How confident do you feel you'll be able to do the following by the end of the semester? Circle one.  
Run three miles in 30 minute      Very    Somewhat    Not at All  
Do a 100 sit-ups without stopping      Very    Somewhat    Not at All  
Lift at least 50% more on each weight machine that you can now      Very    Somewhat    Not at All
- **To Create:** Identify skills or abilities important to success. Create a survey to measure students' self-confidence and administer the survey in class.



Source: Angelo, T.A. & Cross, K.P. (1993). *Classroom Assessment Techniques*. San Francisco, CA: Jossey-Bass, pp. 215-219.

## #6 One Minute Paper/Muddiest Point

### Minute Paper

In concise, well-planned sentences, please answer the question below:



What are the two [three, four, five] most significant [central, useful, meaningful, surprising, disturbing] things you have learned during this session?

### Muddiest Point

What has been the “muddiest” point so far in this session? That is, what topic remains the least clear to you? What questions do you still have?

Source: Angelo, T.A. & Cross, K.P. (1993). *Classroom Assessment Techniques*. San Francisco, CA: Jossey-Bass, p. 146.

## #10 Pros & Cons “Grid”

▪ **Description:** Students jot down a list of pros & cons to help them think clearly about a concept.

▪ **Example: Civil Engineering**—students in a bridge design class studied designs for two suspension bridges, the second of which is significantly more massive & rigid than the other. Student list 3-5 major advantages & disadvantages of the second design.



▪ **To Create:** Focus on a decision, judgment, dilemma or current issue with implications in your discipline. Write a prompt that will elicit thoughtful pros & cons on the topic.

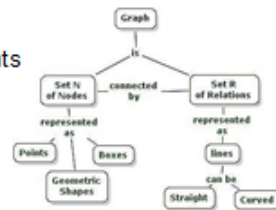
Source: Angelo, T.A. & Cross, K.P. (1993). *Classroom Assessment Techniques*. San Francisco, CA: Jossey-Bass, pp. 165-171.

## #16 Concept Maps

▪ **Description:** Drawings or diagrams showing mental connections students make between major concepts & other ideas

▪ **Example: Economics** instructor first shows students an example he made of “gross national product” & asks them to draw a CM of “free trade.” To assess students’ responses, he makes a CM of “free trade” & then makes a list of critical features to look for.

▪ **To Create:** Select concept and write down terms & phrases related to “stimulus.” Place stimulus at top of page or in center & add major concepts. Add secondary & tertiary associations. Draw connections, adding connecting words where appropriate.



Source: Angelo, T.A. & Cross, K.P. (1993). *Classroom Assessment Techniques*. San Francisco, CA: Jossey-Bass, pp. 197-202.

All of these examples, and more, can be found in Angelo & Cross’s *Classroom Assessment Techniques*, which is available for checkout. An alphabetical list of all 50 CATs is on page 109. If you need assistance in selecting and modifying one for use in your target course, see me.