



**BACKWARD
DESIGN**

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**DETERMINE
ACCEPTABLE
EVIDENCE**

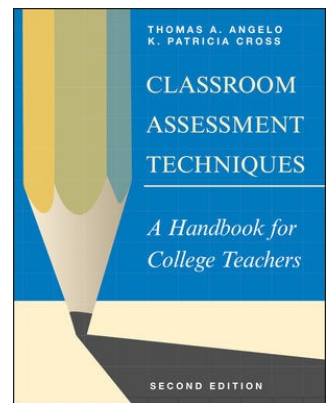


Backward Design - Determine Acceptable Evidence

Classroom Assessment Techniques (CATs) are a set of specific activities that instructors can use to quickly gauge students' comprehension. They are generally used to assess students' understanding of material in the current course, but with minor modifications they can also be used to gauge students' knowledge coming into a course or program.

“Classroom assessment helps instructors to obtain useful feedback on what, how much, and how well their students are learning.” (Angelo & Cross, p. 3). The instructor can use this feedback to inform instruction, such as speeding up or slowing down the pace of a lecture or explicitly addressing areas of confusion.

Angelo and Cross (1993) provide 50 classroom assessment techniques. 5 of these techniques described below can be easily adapted for and implemented in a classroom setting. For information on remaining techniques, please consult the [Angelo and Cross book](#). Many of these techniques are easily adapted to online environments, as well.



For Instructors, CATs:

- Allow you to address student misconceptions or lack of understanding in a timely way,
- Help foster good working relationships with students and encourage them to understand that teaching and learning are ongoing processes that require full participation.



For students, CATs:

- Help develop self-assessment and learning management skills,
- Increase the ability to think critically about the course content,
- Foster an attitude that values understanding and long-term retention,
- Show your interest and support of their success in your classroom.

CAT 1: One Minute Paper

One-Minute Paper is a technique commonly used for *assessing students' reactions to course materials, activities, and assignments*. One-Minute Papers are probably most useful in large lecture or lecture/ discussion courses, although the technique can be easily adapted to other settings. The questions that teachers pose may concern class procedures, content, materials, and assignments, or any other specific element that the instructor wants to examine.



One-Minute Papers work best at the end or the beginning of a class session. It can also be used as a wrap-up activity.

Example:

After the first three weeks of the semester, a chemistry teacher has the feeling that the students in her undergraduate chemistry class (a lecture and lab class with 150 students) may not be getting all that they should from her lectures. Ten minutes before the end of the class period, she quickly passes out index cards to the class. She then asks them to write a very brief answer on the cards to the following two questions: **'What was the most important thing you learned in today's class?' and 'What question or questions that you have from today's class remain unanswered?'**

For further information, please refer to [One Minute Paper](#).



CAT 2: Chain Notes

Chain Notes is a technique commonly used for *assessing students' reactions to teachers and teaching methods*. The purpose of Chain Notes is to elicit very limited written feedback from each student in a class about what student is thinking or noticing about the teaching and learning occurring at a given moment in the class session. Also, chain notes make the most sense in large lecture or lecture-discussion classes where students have little direct contact with the teacher.



Step-by-Step Procedure:

- Select a question focused on a particular concept relevant to your lesson.
- Write the question at the top of a long sheet of paper and place it in an envelope. Write the question on the envelope too and also on the whiteboard so everyone can see it.
- Pass the envelope around the class from student to student, having each student add their response.
- Remind everyone that they must read all the prior responses before adding their own note.
- Encourage students to be brief and take no longer than a minute to write their own ideas.
- Collect the Chain Note at the end and read aloud the responses so everyone can hear what has been written.
- Provide students with opportunities to reply to any responses made by their peers.

Example:

To assess how students were reacting to the lectures in his large Introduction to Psychology course, the instructor decided to make use of the Chain Notes technique. He wrote across the front of a large manila envelope: **“How clear is the content and purpose of the lecture to you at this moment?”** and handed out 3-by-5 index cards at the beginning of the following class and directed the students to respond to the question on the envelope in one or two minutes, drop their cards in the envelope, then pass it on.



CAT 3: Memory Matrix

Memory Matrix is a technique commonly used for *assessing subject matter learning*. It is a two-dimensional diagram used to organize and illustrate relationships. In the activity, the row and column headings are given, but the cells are left empty. As students fill in the blank cells, it provides them feedback on their understanding of content while helping instructors assess students' recall and/or comprehension.

The Memory Matrix assesses students' recall and skill at quickly organizing important course information into familiar categories using a matrix prepared by the instructor. It is best used after a lesson, lecture, or reading that focuses on a substantial amount of clearly categorized information. This kind of matrix can also be used as a pre-instructional assessment.

Example:

Several weeks after the introductory lessons on verb endings, an instructor wonders if students in the elementary Spanish class can quickly and easily categorize the verbs they've learned recently. She hands out the matrix pictured below and gives the class 15 minutes to fill the cells with as many different “base form” verbs as they can recall.

A Sample Memory Matrix for Spanish Verb Endings

	-AR	-ER	-IR
Irregular			
Regular			



CAT 4: One-Sentence Summary

One-Sentence Summary is a technique commonly used for *assessing creative thinking and skill in synthesis*. This technique requires the student to answer the questions represented by WDWWHWW (Who? Do What? To What or Whom?, How?, When?, Where?, and Why?) about a given topic, and then to synthesize those answers into a single informative sentence. The purpose of this strategy is to find out how concisely, completely, and creatively students can summarize a given topic within the grammatical constraints of a single sentence.

Example:

The task is to summarize Classroom Research in one sentence. The matrix is provided as an intermediate step to the summary sentence.

Topic: Classroom Research

The summary in matrix form:

<i>Question</i>	<i>Response</i>
Who?	Teachers
Do What?	Assess
To What or Whom?	Their students' learning
How?	Using classroom assessment techniques and any other appropriate research tools and methods
When?	Regularly during the semester
Where?	In their own classrooms
Why?	To understand and improve learning by improving their own teaching

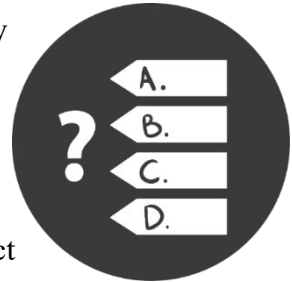
The summary in sentence form:

Teachers assess their students' learning by using classroom assessment techniques and any other appropriate research tools and methods, regularly during the semester in their own classrooms to understand and improve learning by improving their own teaching.



CAT 5: Student-Generated Test Questions

Student-Generated Test Questions is a way of retrieving or recalling previously learned information and processing it. The activity asks students to create likely exam questions on specific content topics along with ideal answers. By having students create questions, instructors help students to recall and process content. The instructor will also be able to assess and correct student expectations of exam questions and responses.



Step-by-Step Procedure:

- Give students time to write their own test questions.
- Provide directions such as, “In your groups (or individually), write 2 (or more) test questions that test concepts discussed in today's lecture. Your questions can be of the following forms (this is up to the instructor): multiple choice, short answer, matching, and etc. Please be sure to include the question as well as the answer.
- After groups or individuals have written their test questions, have them "quiz" the other members of the class with their questions. If the class is stumped, have the group or individual presenting explain the answer.
- Monitor the content of the questions to see what students think are important concepts to be sure to address this issue if question content is something other than what the instructor thinks is central to the course.
- Make a rough tally of the questions your students propose and the topics that they cover and 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 quiz or exam.

Still need help? [Contact CTL](#) to speak with a consultant or arrange a departmental workshop.



References

- Angelo, T. A., & Cross, K. P. (1993). *Classroom assessment techniques*. Jossey Bass Wiley.
- Using Classroom Assessment Techniques. Eberly Center Teaching Excellence & Educational Innovation. Carnegie Mellon University.
<https://www.cmu.edu/teaching/assessment/assesslearning/CATs.html>
- Classroom Assessment Techniques. Center for Excellence in Learning and Teaching. Iowa State University. <https://www.celt.iastate.edu/teaching/assessment-and-evaluation/classroom-assessment-techniques-quick-strategies-to-check-student-learning-in-class/>
- Developing Classroom Assessment Techniques. Center for the Enhancement of Teaching & Learning. University of Northern Colorado.
<https://www.unco.edu/center-enhancement-teaching-learning/pdf/developingcats.pdf>
- Student-Generated Test Questions. Academic Outreach and Innovation. Washington State University.
<https://li.wsu.edu/documents/2018/01/student-generated-test-questions.pdf/#:~:text=Student%2DGenerated%20Test%20Questions%20is,will%20recall%20and%20process%20content.>
- Innovative Instructional Design. University of Nebraska–Lincoln.
<https://executivevc.unl.edu/nfo/Innovative-Instructional-Design.pdf>
- Student Generated Test Questions. Peru State College.
https://www.peru.edu/assessment/_documents/Student-Generated-Test-Questions-CAT.pdf

Further Reading and Resources

- [Chain Notes - LEARN Strategy. K20 Center.](#)
- [Using Student-Generated Questions to Promote Deeper Thinking. Edutopia.](#)
- [Classroom Assessment Techniques. Poorvu Center for Teaching and Learning. University of Yale.](#)
- [Classroom Assessment Techniques. Center for Teaching and Learning. Vanderbilt University.](#)