

TYPES OF MEASUREMENTS

Methods of Assessment

	METHOD OF ASSESSMENT	Assessment Type		Data Type		Assessment Level				
		Formative	Summative	Direct Data	Indirect Data	Classroom	Course	Program	Division	Project
1	Muddiest Point	✓		✓		✓				
2	Directed Paraphrase	✓		✓		✓				
3	Minute Paper	✓		✓		✓				
4	Characteristic Features Recall, Summarize, Question,	✓		✓		✓				
5	Comment, Connect	✓		✓		✓				
6	Transfer and Apply	✓		✓		✓				
7	Anecdotal Records	✓		✓		✓				
8	Concept Tests	✓		✓		✓				
9	Concept Mapping	✓		✓		✓				
10	Quizzes or Exams	✓	✓	✓		✓	✓	✓	✓	
11	Rubrics	✓	✓	✓		✓	✓	✓	✓	✓
12	Essay	✓	✓	✓		✓	✓	✓	✓	
13	Case Studies	✓	✓	✓		✓	✓	✓	✓	✓
14	Problem Solving	✓	✓	✓		✓	✓	✓	✓	
15	Speech	✓	✓	✓		✓	✓	✓	✓	
16	Oral Interview	✓	✓	✓		✓	✓	✓	✓	✓
17	Debate	✓	✓	✓		✓	✓	✓	✓	
18	Product Creation	✓	✓	✓		✓	✓	✓	✓	✓
19	Flowchart or Diagram	✓	✓	✓		✓	✓	✓	✓	✓
20	Team Project	✓	✓	✓		✓	✓	✓	✓	
21	Portfolios		✓	✓		✓	✓	✓	✓	
22	Performance		✓	✓		✓	✓	✓	✓	✓
23	Capstone Project	✓	✓	✓		✓	✓	✓	✓	
24	Reflective Self-Assessment Essay		✓	✓	✓	✓	✓	✓	✓	✓
25	Satisfaction or Perception Surveys		✓		✓	✓	✓	✓	✓	✓
26	Licensing Exams		✓	✓			✓	✓	✓	
27	Standardized Tests		✓	✓			✓	✓	✓	
28	Exit Interviews		✓	✓	✓	✓	✓	✓	✓	✓
29	Focus Groups		✓		✓	✓	✓	✓	✓	✓
30	Pre/Post Testing	✓	✓	✓		✓	✓	✓	✓	✓

1. Muddiest Point

Based on the premise that most lectures can be improved, this method is to ask students to write down the concepts that were least clear to them. Those least understood concepts that total a pre-determined threshold would be addressed by the professor in future lectures or by an additional handout clarifying the subject-matter. Advantages: Requires students to organize and filter their understanding of several topics to select one that was least understood. It requires minimal time to read the results. Disadvantages: This method should be used only occasionally as it focuses on a negative aspect of learning rather than a positive one.

T.A. Angelo and K. P. Cross, 1993. *Classroom Assessment Techniques*, 2nd ed. San Francisco: Jossey-Bass.

<http://www.siue.edu/~deder/assess/cats/muddy3.html>

2. Directed Paraphrase

This method promotes simulation of actual work or life-related experiences. Students are asked to summarize the key concepts from a class or lecture and formulate a written discussion of those concepts to an imagined, specific recipient. The differentiation between this method and a simple summarization is use of role play by the students.

Examples:

1. A nursing student might be directed to paraphrase the concept of drug clearance by the kidneys to a worried patient.
2. An economics student might be directed to paraphrase a point of tax policy to a corporate CEO.
3. A philosophy student might be directed to paraphrase an ethics concept so that it is readily understood by a teenager.

Advantages: Students are challenged in brevity and choice of language when writing the paraphrase. Students become well-prepared for similar situations in the work environment.

Disadvantages: Some students may see this method as informal. This can be avoided by detailed phrasing of the initial question.

<http://www.siue.edu/~deder/assess/cats/paraph1.html>

3. Minute Paper

Students are asked to spend about a minute to write down the main idea of a topic or class. The Minute Paper is commonly used to determine if the main idea of the instructor's lecture is captured by the students. An instructor may request the inclusion of a question students may have on the subject matter, or, ask students to comment on interesting, disturbing, or surprising aspects of a lecture or class.

Advantages: Minute Papers offer immediate feedback and, possibly, positive reinforcement to the professor. There is creative variability in the use of Minute Papers.

Students must use organizational skills to chunk the information and rank the concepts. If questions are used, the assessment becomes integrative. Use of Minute Papers requires minimal time.

Disadvantages: May be time-consuming to review for large classes. Forming teams to answer question(s) may alleviate this issue.

T.A. Angelo and K. P. Cross, 1993. Classroom Assessment Techniques, 2nd ed. San Francisco: Jossey-Bass., p.148-53
<http://www.siu.edu/~deder/assess/cats/minpap4.html>

4. Characteristic Features

Characteristic Features is an assessment technique that requires students to differentiate between characteristics that do or do not define one or more topics. Using a grid structure, the instructor lists several characteristics in the left-hand column. In the columns to the right, the instructors gives topic headers, and the students are to enter a plus, “+” or minus, “-” sign to designate whether the characteristic in the left hand column is or is not applicable to the topic header.

Example:

Characteristic Feature	Grades	Classroom Assessment
1. More closely focused on improving learning and teaching rather than on recording results	-	+
2. Used primarily at the end of a course or project	+	-
3. Source material is usually collected anonymously	-	+
4. Mostly quantitative and suitable for statistical analysis	+	-
5. Directly mirrors student understanding of course	+	+
6. Emphasizes judgmental process and summative evaluation	+	-
7. Results designed for official and external use	+	-
8. Use of standardized and externally validated instruments preferred	-	-
9. Requires training in research methods	-	-
10. Results useful to professors and students	+	+

Source: Southern Illinois University, Classroom Assessment

Advantages: Characteristic Features measure students’ use of analysis to identify central concepts. Scanning results is simple and can be done quickly.

Disadvantages: Grid creation may be time-consuming. Students may score highly due to random selection rather than content knowledge.
<http://www.siu.edu/~deder/assess/cats/featur6.html>

5. RSQC2 - Recall, Summarize, Question, Comment, and Connect

Students take two minutes to *recall* and list in rank order the most important ideas from a previous day's class. Then they take another two minutes to *summarize* those points in a single sentence in order to "chunk" the information. Next, students are asked to write one major *question* that they want answered. Finally, students identify a thread or theme to *connect* this material to the course's major goal. As an option, students may add a *comment* regarding their confidence in or wariness of the specific course content.

Advantages: RSQC2 requires students to organize information and to comprehensively assess how it applies to the overall foundation of the course.

Disadvantages:

RSQC2 is time-consuming to evaluate. It also forces the professor to evaluate the course structure.

T.A. Angelo and K. P. Cross, 1993. *Classroom Assessment Techniques*, 2nd ed. San Francisco: Jossey-Bass., p. 344-8

<http://www.siue.edu/~deder/assess/cats/rsq9.html>

6. Transfer and Apply

Students are asked to take course theories learned and to transfer the knowledge to applications and situations they have experienced.

Advantages: Because transference of learned material is a challenging cognitive achievement, Transfer and Apply provides students practice in mastering the task. Evaluating the results may be done rather quickly.

Disadvantages: Creating rubric to assess Transfer and Apply may be time-consuming. (see section on Rubrics)

T.A. Angelo and K. P. Cross, 1993. *Classroom Assessment Techniques*, 2nd ed. San Francisco: Jossey-Bass., p. 236-9

<http://www.siue.edu/~deder/assess/cats/apps9.html>

7. Anecdotal Records

Anecdotal Records are written observations of instructional experiences within a predefined set of content standards.

Advantages: Anecdotal records facilitate review of assessment and curriculum by providing observations of student learning.

Disadvantages: This method requires planning, preparation and may be time consuming during class time.

8. Concept Tests

Concept tests are a technique used where the instructor asks questions about key concepts and offers students several possible answers. Students are asked to select an answer and to indicate immediately, either by show of hands or by clicker, the answer selected. If the majority of the class has not mastered the concept, students are then asked to discuss with their neighbor the reasons supporting their choice. A second assessment is given by the instructor to re-assess knowledge.

Example:

Advantages: This classroom assessment works well in large classes. Students require little training for Concept tests. It takes minimal class time to perform the tests and to analyze results.

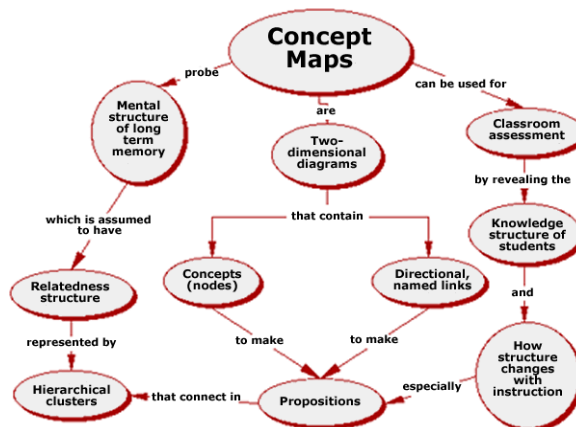
Disadvantages: Formulating the questions and possible answers for the Concept tests can take time initially. There is a cost involved in the clicker system.

<http://www.flaguide.org/cat/contests/contests1.php>

9. Concept Maps

Concept Maps are a visual tool allowing students to see the relationships between general and specific concepts. Concepts are given in a hierarchical design, with links between defining the nature of the relationships.

Example:



Source: <http://www.flaguide.org/cat/conmap/conmap2.php>

Advantages: Effective for assessing students' understanding of complex relationships.
Disadvantages: Instructor prep time can be significant for creating fill-in Concept Maps.

See also: **Flowcharts or Diagrams**

<http://www.flaguide.org/cat/conmap/conmap1.php>

<http://classes.aces.uiuc.edu/ACES100/Mind/c-m2.html>

10. Quizzes or Exams

These are locally developed instruments designed by faculty to measure knowledge in single or multiple components of a course.

Advantages: The content is easily modified to adapt to specific outcomes. Results are meaningful for both student evaluation and learning outcomes. Embedding Learning Outcomes into the quiz or exam is uncomplicated. Feedback may be rapid.

Disadvantages: Creating quizzes or exams may be time-consuming. Determining reliability and validity require extensive knowledge in measurement.

http://www.apa.org/ed/eval_strategies.html

11. Rubrics

A rubric is a scale designed for scoring student work against a pre-defined set of criteria. A rubric is typically in table format with two or more criteria and two or more levels of performance to be measured.

Analytical rubrics specify individual criteria and evaluate these standards independent of one another.

Holistic rubrics measure performance across multiple factors as a complete product.

Advantages: Assessment is objective and consistent. Rubrics clearly document and communicate expectations.

Disadvantages: Using rubrics may be limiting to student creativity as students strive to follow a predefined outline. Rubrics are time-consuming to create.

<http://jonathan.mueller.faculty.noctrl.edu/toolbox/rubrics.htm>

http://www.ion.illinois.edu/resources/pointersclickers/2004_03/benefits.asp

12. Essays

Essays are a written evaluation of a topic utilized to demonstrate a student's ability to plan, research, analyze, organize and synthesize information. Students develop stronger communication skills through essay writing.

Advantages: Effective for assessing students' understanding of multiple concepts.

Disadvantages: Grading is time-consuming.

http://www.apa.org/ed/eval_strategies.html

13. Case Studies

Case studies are actual issues and problems that students analyze to formulate alternative solutions for the situations. Numerous case studies in various disciplines have been developed by academic institutions and are available for purchase and use by other schools.

Advantages: Case studies demonstrate analytical and synthetic thinking well. Also, students benefit from relating other knowledge to topic.

Disadvantages: The learning experience is dependent on student knowledge from multiple areas.

http://online.bakersfieldcollege.edu/courseassessment/Section_4_Assessment_Tools/Section4_8Toolslinks.htm#Case%20Study

14. Problem Solving

Problem Solving uses the same approach as Case Studies, but may leave more developmental problem solving to the student. For instance, the student must develop the experiment or tests to obtain data.

Advantages: This technique displays analytic and synthetic thinking well and is authentic if real world situations are used.

Disadvantages: Problem solving assessment is difficult to grade due to multiple methods and potential multiple solutions.

http://online.bakersfieldcollege.edu/courseassessment/Section_4_Assessment_Tools/Section4_8Toolslinks.htm#Case%20Study

<http://www.ruf.rice.edu/~lane/rvls.html>

15. Speech

Oral speech is a method used to emphasize a student's organizational and verbal communication skills. Students may be required to analyze an issue or situation and verbally present the findings or students may be asked to memorize passages to recite verbatim.

Advantages: Students improve skills in public speaking and organization.

Disadvantages: Some students may be insecure about public speaking.

http://online.bakersfieldcollege.edu/courseassessment/Section_4_Assessment_Tools/Section4_8b.htm

<http://serc.carleton.edu/NAGTWorkshops/assess/oralpresentations.html>

16. Oral Interview

An oral interview provides a portrait of a student's understanding about a specific concept or set of related concepts. The interview may consist of a question and answer session or a task or problem-solving exercise.

Advantages: Appropriate for all disciplines.

Disadvantages: Several hours may be required to develop a reliable questions or problem sets. Interviews are best used when the student has developed a comfortable relationship with the professor.

<http://www.colorado.edu/pba/outcomes/ovview/mwithin.htm>

17. Debate

A debate is an oral speech contest between competing sides about a specific topic or proposition. Debates increase student abilities in knowledge, speaking skills, reasoning skills and analysis.

Advantages: Students are required to organize thoughts and formulate clear and concise arguments in a short period of time. Depending upon the number of students involved, the debate process may emphasize teamwork.

Disadvantages: Students from collective cultures may be uncomfortable with public displays of disagreement.

http://online.bakersfieldcollege.edu/courseassessment/Section_4_Assessment_Tools/Section4_8b.htm

http://www.apa.org/ed/eval_strategies.html

18. Product Creation

Product creation requires the student to construct a tangible product. Students exhibit knowledge and practical skills required for the processes and outputs.

Advantages: Students have the opportunity to demonstrate employability.

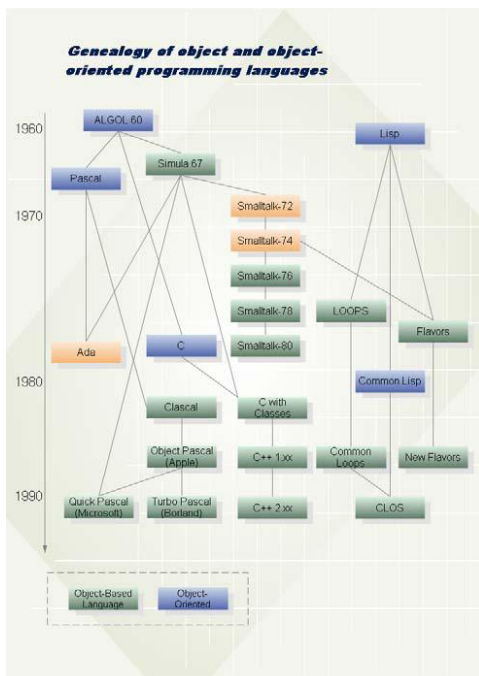
Disadvantages: Colleges may be limited in resources available for product creation.

http://online.bakersfieldcollege.edu/courseassessment/Section_4_Assessment_Tools/Section4_8b.htm

19. Flowchart or Diagram

A flowchart is a visual or graphical representation, primarily through the use of symbols, of the logic or sequence of steps in a process, operation, function, or activity. Students must recall information and also analyze and synthesize organization and structure to develop systematic steps within the process.

Example:



Advantages: Effective for assessing student understanding of complex relationships.

Disadvantages: Instructor preparation may be time consuming to create complex outline of flowcharts.

See also: [Concept Map](#)

http://online.bakersfieldcollege.edu/courseassessment/Section_4_Assessment_Tools/Section4_8Toolslinks.htm#Case%20Study

Source: <http://www.edrawsoft.com/flowchart-examples.php>

20. Team Project

Team projects are collaborative projects produced to cover concepts in one course, multiple courses, such as learning communities, or community projects, such as service learning.

Advantages: Appropriate for assessing students' knowledge of multiple concepts, as well as multiple levels of understanding and application.

Disadvantages: May be difficult to assess individual student involvement. Additional time may be required due to collaboration with faculty from other disciplines.

http://online.bakersfieldcollege.edu/courseassessment/Section_4_Assessment_Tools/Section4_8Toolslinks.htm#Case%20Study
http://www.cpcs.umb.edu/partners_projects/partners_projects_collaborations.htm

21. Portfolios

Portfolios are collections of students work that demonstrate the progress and level of learning that occurs over a period of time. The variety of work maintained in the portfolio illustrates multiple levels of learning.

Advantages: Analyzing a portfolio of work allows the faculty to assess a broad spectrum of knowledge at one time. Also, it allows for assessment of several learning objectives simultaneously. Portfolios are useful for a number of disciplines. Portfolios are easily adaptable to measuring different levels of assessment (e.g. course, program, general education).

Disadvantages: May be labor-intensive to assess at the end of a term or program. Depending upon the course or program, portfolios may require physical storage space for hard copies.

<http://www.provost.wisc.edu/assessment/manual/manual2.html#a4>

22. Performances

A performance is an execution of an action or artistic work. Performances emphasize what the student is able to do. Students receive valuable practical experience through active learning.

Advantages: Performances are adaptable. They promote student self-assessment. Students have the opportunity to demonstrate employability.

Disadvantages: Preparation and assessment for performances can be time-consuming. Students who are insecure may be dissuaded from participation. Depending upon the discipline assessed, this method may require extensive training of reviewers.

<http://www.austincc.edu/oi epub/pubs/effectiveness/iu manual.pdf> p 24

23. Capstone Project

A Capstone project measures student achievement of a broad knowledge base derived from participation in a program or a specific series of courses.

Advantages: Capstone projects are cumulative and integrative. Assessment of projects provides a setting for department or discipline-specific dialogue.

Disadvantages: Capstone projects can be labor-intensive. Coordination across the departments or disciplines may be challenging.

<http://www.colorado.edu/pba/outcomes/ovview/mwithin.htm>

24. Reflective Self-Assessment Essay

Students are asked to reflect on their college experiences. They must critically assess their academic growth and development in essay form, providing substantiation for their positions. When used in combination with Student Portfolios, students can observe development and document progress thoroughly.

Advantages: Student perspective is authentic.

Disadvantages: Reflective Self-Assessment is an indirect method of assessment.

http://online.bakersfieldcollege.edu/courseassessment/Section_4_Assessment_Tools/Section4_8Toolslinks.htm#Case%20Study

25. Satisfaction or Perception Surveys

Student satisfaction or perception surveys are used to gather data about student priorities and satisfaction. Surveys can be locally created or commercially standardized. Some standardized surveys allow for partial customization to allow the department or school to collect specialized data.

Examples: CCSSE and NSSE on student engagement, Noel-Levitz SSI (Student Satisfaction Inventory), CSEQ College Student Experiences Questionnaire

Advantages: For commercially developed surveys, scores are immediate and data are compared to student populations nationwide.

Disadvantages: Usually the college-wide instruments such as CCSSE are administered not for class-level feedback, but for college-level feedback; therefore, it is hard to use these surveys for class-based review of your own students. It is time consuming to generate questions for locally developed surveys.

See also: Exit Interview

http://online.bakersfieldcollege.edu/courseassessment/Section_4_Assessment_Tools/Section4_8Toolslinks.htm#Case%20Study

<http://www.mtsac.edu/administration/research/pdf/tips/ResearchTips%20v1n1%20designing%20surveys.pdf>

26. Licensing Exams

Many vocational careers require students to pass licensing exams to enter a specific field of work. Sample licensing exams are available for many professional licenses.

Advantages: Students see probable outcome of their preparation. Sample scores are useful for assessing areas of student strength and weakness, in order to modify and improve instruction.

Disadvantages: Low scores on sample exams may disillusion students.

http://online.bakersfieldcollege.edu/courseassessment/Section_4_Assessment_Tools/Section4_8Toolslinks.htm#Licensing%20Exams

27. Standardized Tests

Standardized tests are assessments created and tested under controlled conditions to determine the level of learning acquired. Student competencies are measured and compared to national standards.

Advantages: Benefits include broad public usage and ease of data comparison. Results demonstrate external validity. Recent high-school graduates may have familiarity with the format of standardized tests.

Disadvantages: Unlike locally-developed quizzes or exams, standardized tests do not offer the flexibility of customization to various goals or outcomes. Faculty may be unable to clearly determine where student succeed and fail.

<http://www.provost.wisc.edu/assessment/manual/manual2.html#a3>

28. Exit Interviews

Exit Interviews ask students to reflect upon student learning and their educational experiences. Students are asked about instructional approaches, classroom environments and perceptions of assignments that best encourage student learning.

Advantages: Provides authentic and immediate feedback useful for assessing program improvement. Interaction with students may provide richer data collection. Interviews allow for clarification and depth of inquiry.

Disadvantages: Best if used in conjunction with other assessment tools.

See also: Satisfaction or Perception Surveys

<http://www.skidmore.edu/administration/assessment/hbmethods.htm#indirect>

29. Focus Groups

Focus groups are interactive discussions among a small pool of participants. Students are asked about attitudes towards their educational experience.

Advantages: Focus groups allow for in-depth inquiry, clarification, and follow-up on issues. Useful when combined with quantitative analysis for a broad understanding of issues.

Disadvantages: Data is indirect. Assembling groups of students may be challenging due to scheduling differences. Focus group data may be biased. Focus group moderator must be properly trained to address the group. Requires additional personnel to record and/or transcribe responses.

<http://www.mtsac.edu/administration/research/pdf/tips/ResearchTips%20v1n3%20focus%20groups.pdf>

30. Pre-Post Assignment/Test

At the onset of a course, an assignment or test is administered to measure the baseline level of understanding of one or more concepts. After learning occurs, a similar assignment or test is given to determine the level of learning.

Advantages: Pre-test results offers direction for group learning. This methods provides immediate feedback, if desired.

Disadvantages: Possible tendency to teach to the post test or assignment.

<http://www.pvc.maricopa.edu/AI/documents/PrePost.doc>