

# *Assessing Student Learning*

*Victor Valley College*



## **Introduction**

The purpose of this manual is to make developing SLOs possible and practical in any course or program. Good assessment requires faculty with expertise and resources to measure and report

learning in a variety of courses, under diverse conditions, about students with varied abilities and levels of academic engagement.

Higher education faculty members are hired for their discipline expertise. Training in pedagogy and assessment often occurs on the run. Many of us emulate the most effective faculty from our own college experience. But assessing student learning is not new to faculty; we do this every semester as we evaluate student work. However, meeting the assessment expectations delineated in the new accreditation standards requires conventions beyond typical grading. The good news is that assessment practices can make student evaluation more meaningful, benefit your teaching, and improve student learning.

Faculty must be both discipline experts and skilled assessment practitioners. Throughout this manual, assessment practices will be modeled in the same way that you might use them in your classroom.

This manual is based adapted from workbooks and materials developed by Janet Fulks and colleagues at Bakersfield College, 2004 and Marci Alanraig Cabrillo College.

## Student Learning

“We want students to *be* effective communicators, to *be* discriminating critical thinkers, to *have* content knowledge, to *be* life-long learners, to *have* aesthetic appreciation, and so on. The problem with goals is that they are basically invisible. How can one tell if students

possess these attributes? Faculty members often say, “I can tell that my students are learning because I can see it in their eyes.” This is nonsense, of course, because the clairvoyance claimed by the faculty members is neither reproducible nor transferable to anyone else. Hence, we need to do assessment in order to figure out how effective our curriculum is at producing the desired learning. But if goals are inherently invisible, how do we assess whether students have actually learned them? The key is to assess visible *indicators*. This means translating goals into associated, tangible learning objectives. In order to make this translation, professors need to answer this question: “What would you, a reasoned skeptic, need to witness in order to be convinced that students were on the path toward achieving the designated goal?” For example, if the goal is *effective communication* in a chemistry student, then the learning objective might be *delivery of a speech on a technically complex topic using jargon-free speech to a lay audience*. The speech would be an *indicator* that the student is an effective communicator and that the curriculum is effective in producing students with this attribute”

Dr. Douglas Eder Southern Illinois University Edwardsville (SIUE)



### **Assessment Tools**

This manual embeds assessment activities in an attempt to model assessment not only as a means to collect data, but also as a tool to both engage students and teach material. Some of these assessment

activities involve short immediate feedback questions using a technique developed by Angelo and Cross called Classroom Assessment Techniques (CATs). However, while very valuable, assessment of student learning goes beyond the short anonymous feedback techniques used in CATs. Classroom Assessment Techniques as described by Angelo and Cross's.

Some assessments within this manual will involve self-evaluative questionnaires to help you define your teaching practice. Most of these are quick surveys, linked to online forms, scored automatically, and often provide comparisons with people from the same and other disciplines.

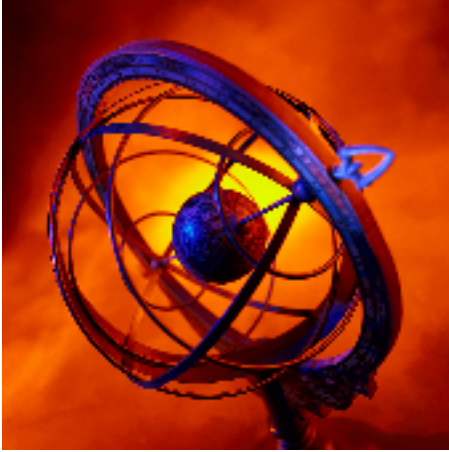
When the inbuilt assessments ask you to discuss ideas or classroom practices with other faculty - please do this; dialogue is essential to the assessment process and will initiate rich professional discussions. As you talk to others keep the following things in mind:

- each course and classroom has unique factors
- disciplines have unique language and culture
- cross disciplinary conversations are invaluable
- ultimately discipline-specific conversations best define student competencies
- everyone is a learner when it comes to assessment
- as professionals we are both guided and constrained by the principles of academic freedom (see link to the right for the official AAUP academic freedom policy)

## Assessment Cycle\*

\* While the Assessment cycle is continuous, as we engage in this ongoing process, we will begin with Developing Student Learning Outcomes

*WRITING STUDENT  
LEARNING OUTCOMES*





## ***Student Learning Outcomes***

When planning for our courses and programs, the primary question is no longer, "What will I teach (or what content will I cover) in this class or program?". The primary question becomes "What will the students learn?"

Assessment forces us to look at what the students will be *able to do* at the end of the course (or program, or counseling appointment, or student government activity) that they *could not do at the beginning*.

There are two more important questions, "How will I know what they can do?" and "How will students know what they can do?"

The heart and core of assessment are statements that define what the students should be able to do - the student learning outcomes (SLOs).

## The Language of Assessment

**Outcomes** - something that happens to an individual student as a result of attendance at a higher education institution.

**Learning** - particular levels of knowledge, skills, and abilities that a student has attained at the end of engagement in a particular set of collegiate experiences.

**Knowledge** - particular areas of disciplinary or professional content that students can recall, relate, and appropriately deploy.

**Skills** - the learned capacity to do something.

**Attitudinal outcomes** - changes in beliefs or development of certain values.

**Abilities** - the integration of knowledge, skills, and attitudes in complex ways that require multiple elements of learning.

**Competencies** - the specific level of performance that students are expected to master.

Student learning outcomes are the specific measurable goals and results that are expected subsequent to a learning experience. These outcomes may involve knowledge (cognitive), skills (behavioral), or attitudes (affective) that display evidence that learning has occurred, at a specified level of competency, as a result of a course or program.

Learning outcomes are clear and assessable statements that define what a student is able to DO at the completion of a course or program.

### How do objectives and goals differ from learning outcomes?

Student learning outcomes build upon, but are different from, course or program objectives and goals because they represent a new perspective.

Objectives	Outcomes
Objectives represent valuable skills, tools, or content (nuts and bolts) that enable a student to engage a particular subject.	SLOs represent overarching products of the course.
Objectives focus on content and skills important within the classroom or program: what the staff and faculty will do. Often termed the input in the course.	Outcomes express higher level thinking skills that integrate the content and activities and can be observed as a behavior, skill, or discrete useable knowledge upon completing the class.
Objectives can often be numerous, specific, and detailed. Assessing and reporting on each objective for each student may be impossible.	An assessable outcome is an end product that can be displayed or observed and evaluated against criteria.

“Outcomes demonstrate an understanding and application of a subject beyond the nuts and bolts which hold it together; objectives represent the nuts and bolts.” (BC Chemistry Prof).

## Goals, Objectives & Outcomes

### Course Goal – the purpose of the course

- The goal of this general art course is to cultivate a sense of aesthetic significance through analysis of problems and interpretations as they apply to a variety of disciplines
- The goal of this general education biology course is to help students acquire and retain relevant biologic knowledge/information, teach them to think/apply this knowledge, and stimulate them to continue learning in the field.
- The goal of this nutrition course is to prioritize key nutrition behaviors, identify health and nutrition needs, and integrate these behaviors into health interventions, educational training, and policy.

### Course Objectives – the specific teaching objectives detailing course content and activities. (see examples for the nutrition course)

- Review nutritional recommendations and components.
- Discuss differences in nutritional requirements associated with sex, age, and activity.
- Describe causes and consequences of nutritional problems.
- Explain complications of underlying physiologic conditions (e.g. diabetes & mal-absorption).  
Identify key factors involved in correcting nutritional behaviors.
- Describe resources and strategies to treat nutritional disorders.

### Course SLO – This is an outcome that describes what a student will do at the end of this nutrition course.

- A student will be able to analyze a documented nutritional problem, determine a strategy to correct the problem, and write a draft nutritional policy addressing the broader scope of the problem.

## SLO or Objective?

The statements below were written for programs and courses. Analyze the statements to determine whether they are goals, objectives, or student outcomes. Write G for goals, OB for objectives and SLO for student learning outcome in front of each statement.

	(Engineering course) This course introduces senior engineering students to design of concrete components of structure and foundation and integrate them into overall design structures.
	(History course) The student is able to function in teams.
	(Engineering course) Functioning as a member of a team, the student will design and present a concrete structure which complies with engineering standards.
	(Geography course) This course will develop perspectives on GIS for representing data, information, knowledge – interplay among reality, database, and map display.
	(Epidemiology course) Define and assess an epidemic for a given population and recommend factors influencing the use of health services.
	(Ecology course) Critically review and synthesize the findings in scientific literature and make appropriate ecological recommendations based on current knowledge.
	(Sociology course) Students will understand that individuals (and their families) must be regarded uniquely as individuals with many contributing variables such as multicultural issues.
	(Gen Ed. Communication course) In addition to interpersonal communication, we will cover key issues in contemporary mass media, with an emphasis on the nature of media competition, entertainment and news, movies, television, newspapers and the Internet.
	(Immunology course) This course will provide students with a medically relevant foundation of knowledge regarding the components and basic principles of the immune system and the vocabulary and language of immunology.
	(Math course) Given data students will analyze information and create a graph that is correctly titled and labeled, appropriately designed, and accurately emphasizes the most important data content.

## SLO or Objective Answers

The statements below were written for programs and courses. Analyze the statements to determine whether they are goals, objectives, or student outcomes. Write G for goals, OB for objectives and SLO for student learning outcome.

G	(Engineering course) This course introduces senior engineering students to design of concrete components of structure and foundation and integrate them into overall design structures.
Obj	(History course) The student is able to function in teams.
SLO	(Engineering course) Functioning as a member of a team, the student will design and present a concrete structure which complies with engineering standards.
G	(Geography course) This course will develop perspectives on GIS for representing data, information, knowledge – interplay among reality, database, and map display.
SLO	(Epidemiology course) Define and assess an epidemic for a given population and recommend factors influencing the use of health services.
SLO	(Ecology course) Critically review and synthesize the findings in scientific literature and make appropriate ecological recommendations based on current knowledge.
Obj	(Sociology course) Students will understand that individuals (and their families) must be regarded uniquely as individuals with many contributing variables such as multicultural issues.
Obj	(Gen Ed. Communication course) In addition to interpersonal communication, we will cover key issues in contemporary mass media, with an emphasis on the nature of media competition, entertainment and news, movies, television, newspapers and the Internet.
G	(Immunology course) This course will provide students with a medically relevant foundation of knowledge regarding the components and basic principles of the immune system and the vocabulary and language of immunology.
SLO	(Math course) Given data students will analyze information and create a graph that is correctly titled and labeled, appropriately designed, and accurately emphasizes the most important data content.

## Writing Student Learning Outcomes (SLOs)

### When writing SLOs:

- **Focus on what the student can do.** Don't address what was taught or presented, but address the observable outcome you expect to see in the student.)
- **Use active verbs.** Active verbs are easier to measure. For instance, if you want the students to understand how to correctly use a microscope - using the word *understand* is not measurable. Can you measure understanding? Instead try to imagine the outcome - Students will focus and display an image on the microscope. For this I can both develop criteria and measure ability.
- **Include an assessable expectation.** It helps if you have clearly defined expectations concerning the criteria related to that outcome. In the above example, some of the criteria related to using the microscope would include:
  - a clearly focused image
  - correct lighting adjustment of the diaphragm and condenser
  - appropriate magnification for the object
  - an evenly distributed specimen field
  - clearly located object identified by the pointer
  - a written identification
- **Share the outcomes with faculty from other disciplines and within your own discipline.** This helps focus the meaning of the statements. For instance in the above criteria the faculty may ask for clarification of "appropriate magnification."
- **Share the outcomes with your students.** Students need to clearly understand what is expected, they are unfamiliar with the discipline specific language. This helps focus the clarity of the statements.
- **Modify as you learn from experience.** Leave the word "DRAFT" at the top of your SLOs to remind yourself and communicate to others that you are actively improving them.

## Brainstorming about Courses & Programs

Beginning is often the most difficult step. Remember that you have been doing this all along. Now is your chance to put what you know intuitively as a professional into words.

**BRAINSTORM:** In the boxes below briefly answer the questions about your course or program. This will help with defining the framework for linking course Student Learning Outcomes to program outcomes.

Instructional Course & Programs Outcomes
Name a specific course or program
Are there any prerequisites for this course?
Does this course serve as a prerequisite for any other courses?
Course Purpose

- ◆ As the expert in this discipline and course, begin by thinking about the 3-5 most important things a student should leave your class being able to DO. 3-5 may not seem like enough, you may have 20-50 objectives for a course - but these represent the 3-5 things you will assess - most people would not want to assess and make public 20-50 different objectives.
- ◆ Spend 15 minutes brainstorming, write down words that express knowledge, skills, or values that integrate the most important aspects of your class.

**BRAINSTORM:** In the boxes below briefly list words or descriptions of attitudes, skills, or knowledge that you would like your students to know or do as a result of this course or student services program.

Attitudes or values developed as a result of this course	
Skills or performance ability as a result of this course	
Knowledge and concepts they will have as a result of this course	

### Student Learning Outcomes Worksheet

Now that you have done some brainstorming, use the Worksheet on the next page and:

- 1) In one sentence, describe one **major** piece of knowledge, skill, ability or attitude that a student will have gained by the end of your class. Describe what students will **do**- not content, activities or hours.
- 2) Use action verbs.
- 3) Write it in language that a student will understand.
- 4) Make sure that the outcome is something that can be assessed or tested.
- 5) Hint: Sometimes it's easier to start backwards by thinking about the major assessments you use in the course. These would be the products or demonstrations of your outcomes. Make a list of your major assignments for this course. Then try to describe in one sentence what the students are being asked to demonstrate in those assignments.
- 6) A word of warning: Be careful when describing attitudes in a learning outcome. They are hard to assess. Ask yourself if the attitude is crucial to success in your course. If a student doesn't have a certain attitude, but possesses the knowledge and skills being taught, is that satisfactory?
  - ◆ Use the checklist to compare your SLOs to some criteria.
  - ◆ Compare the SLO drafts with:
    - course outlines
    - core concepts articulated by professional organizations
    - external expectations such as board requirements or standards
    - articulation and prerequisite agreements

## Writing Student Learning Outcomes Worksheet

Course Name and Number \_\_\_\_\_

<b>Outcome</b> 1 sentence that describes a major piece of knowledge, skill, ability or attitude that students can demonstrate by the end of the course	<b>Assessment</b> Major Assignment, Project or test used to demonstrate or apply outcome

## Checklist for Writing Student Learning Outcomes

<b>Checklist for Writing Student Learning Outcomes</b>	<b>Yes</b>	<b>No</b>
Do the SLOs include active verbs?		
Do the SLOs suggest or identify an assessment?		
Do the SLOs address the expected level of learning for the course using Bloom's Taxonomy as a guideline?		
Do the SLOs address more than one domain (cognitive, psychomotor, and affective)?		
Are the SLOs written as outcomes rather than as objectives? 1. Language indicates an important overarching concept (Big Picture) versus small lesson or chapter objectives. 2. Outcomes address what a student will be able to <b>do</b> at the completion of the course. 3. SLOs address student competency rather than content coverage.		
Are the SLOs appropriate for the course? <ul style="list-style-type: none"> <li>• Consistent with the curriculum document of record</li> <li>• Represents a fundamental result of the course</li> <li>• Aligns with other courses in a sequence, if applicable</li> <li>• Represents collegiate level work</li> </ul>		
Will students understand the SLOs?		
Comments or suggestions:		

As you talk to others about SLOs keep these things in mind:

- Each course and classroom has unique factors.
- Disciplines have unique language and culture.
- Cross disciplinary conversations are invaluable.
- Ultimately discipline-specific conversations best define competencies for students.
- Everyone is a learner when it comes to assessment.
- As professionals, we are guided by the principles of academic freedom.

## **SLOs, Bloom's Taxonomy, Cognitive, Psychomotor, and Affective Domains**

Bloom (1948) developed classifications of intellectual behavior and learning in order to identify and measure progressively sophisticated learning. College faculty are hired because of their discipline expertise and are sometimes unfamiliar with important pedagogical theories that contribute to effective learning. Bloom's taxonomy is especially important in higher education where outcomes need to address the student ability to use information, not just recall and regurgitate concepts. Lower levels of learning are easier to assess but do not adequately display what the student can DO with the knowledge. Refer to the next page for a diagram of Bloom's increasing levels of complex learning.

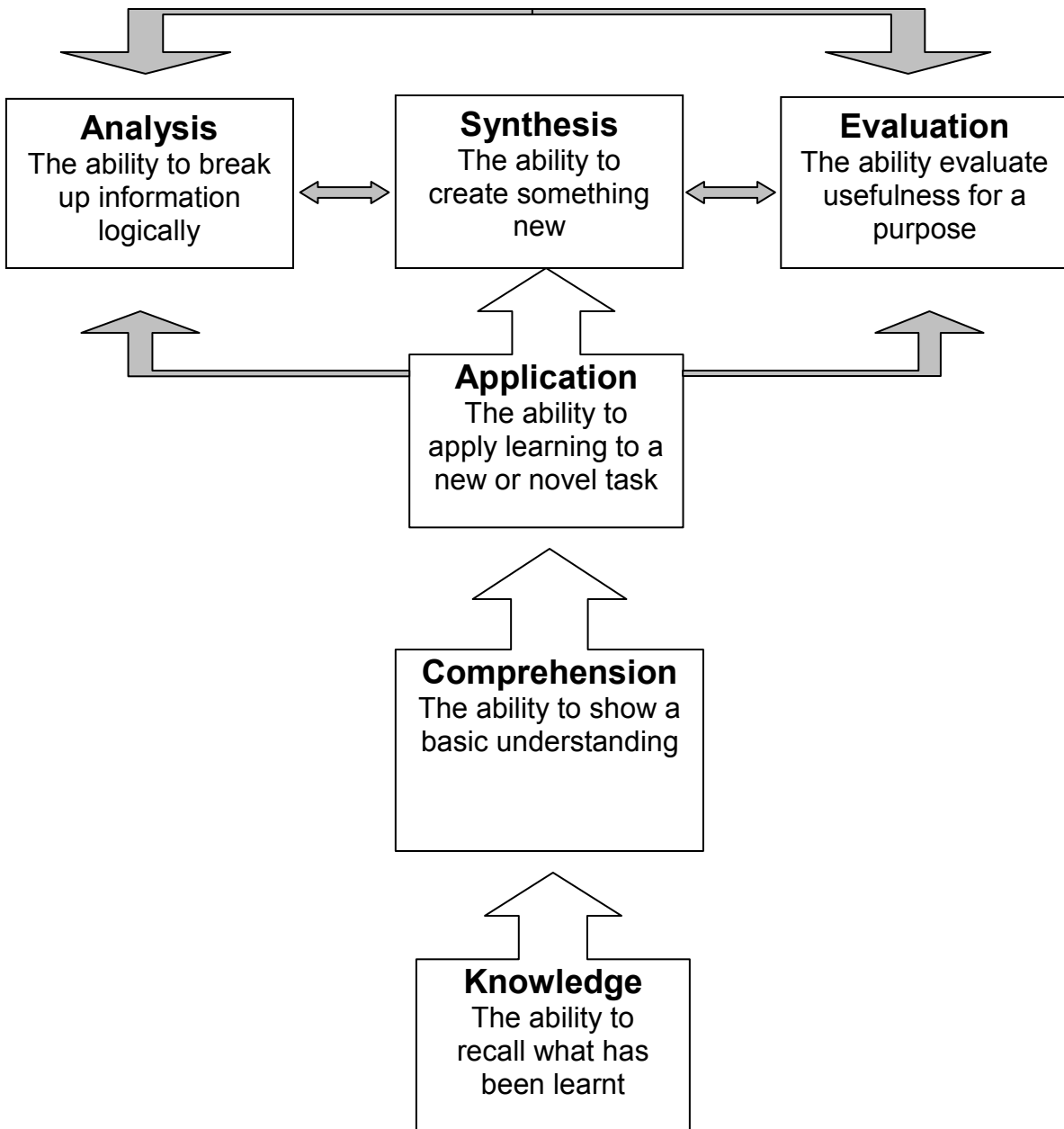
However, learning is not a purely cognitive function; learning occurs differently when it entails performing a skill or re-evaluating behavior. Three domains of learning are recognized:

- Cognitive domain defining knowledge classification. See the following page for a table describing increasing complexity in cognitive learning. Each level has examples of verbs that could be used in writing an SLO at this level. These verbs are not magic or mandatory, our faculty found them helpful, so we used a variety of models and created our own.
- Psychomotor domain (Gronlund, 1970; Harrow, 1972; Simpson, 1972) defining physical skills or tasks classification. Check out the psychomotor table on the following page.
- Affective domain (Krathwhol, Bloom, and Masia, 1964) defining behaviors that correspond to attitudes and values. Please refer to the affective table. Affective outcomes tend to be the hardest to articulate initially and often appear difficult to assess at first glance. However, cognitive outcomes often represent the outcomes most closely related to deeper thinking and life-long learning, as well as the outcomes we value most.

NOTE: Student learning outcomes should address relevant outcomes for each of these domains but must be appropriate to the course.

Think about possible means of assessing the outcomes. The essence of student learning outcomes lies in focusing on the results you want from your course rather than on what you will cover in the course. Ask yourself how you will know when you have accomplished those outcomes

### Interrelationships Between Bloom's Cognitive Levels



Hall, C. & Johnson, A. (1994) Module A5: Planning a Test or Examination. In B. Imrie & C. Hall, Assessment of Student Performance. Wellington, New Zealand: University Teaching Development Centre, Victoria University of Wellington.



## Cognitive Domain

### Learning Outcomes Related To Knowledge

Knowledge	Comprehension	Application	Analysis	Synthesis	Evaluation
Student remembers or recognizes information or specifics as communicated with little personal assimilation.	Student grasps the meaning behind the information and interprets, translates, or comprehends the information.	Student uses information to relate and apply it to a new situation with minimal instructor input.	Student discriminates, organizes, and scrutinizes assumptions in an attempt to identify evidence for a conclusion.	Student creatively applies knowledge and analysis to integrate concepts or construct an overall theory.	Student judges or evaluates information based upon standards and criteria, values and opinions.
Cite Label List Enumerate Identify Imitate Match Name Quote Recall Reproduce State Write	Convert Define Describe Discuss Estimate Explain Generalize Identify Illustrate Locate Paraphrase Restate Summarize	Apply Chart Compute Demonstrate Determine Dramatize Establish Make Manipulate Prepare Project Solve Use	Analyze Compare Contrast Correlate Diagram Dissect Differentiate Distinguish Infer Investigate Limit Outline Separate	Assemble Create Construct Design Develop Formulate Generate Hypothesize Initiate Invent Modify Reframe Synthesize	Access Appraise Conclude Critique Decide Defend Diagnose Evaluate Judge Justify Rank Recommend Support

Basic  
Knowledge  
Level

More Sophisticated  
Higher Level Thinking  
Critical Thinking



Psychomotor Domain  
**Learning Outcomes Related To Skills**

<b>Observe</b>	<b>Model</b>	<b>Recognize Standards</b>	<b>Correct</b>	<b>Apply</b>	<b>Coach</b>
Students translate sensory input into physical tasks or activities.	Students are able to replicate a fundamental skill or task.	Students recognize standards or criteria important to perform a skill or task correctly.	Students use standards to evaluate their own performances and make corrections.	Students apply this skill to real life situations.	Students are able to instruct or train others to perform this skill in other situations.
Hear Identify Observe See Smell Taste Touch Watch  *Usually no outcomes or objectives written at this level.	Attempt Copy Follow Imitate Mimic Model Reenact Repeat Reproduce Show Try	Check Detect Discriminate Differentiate Distinguish Notice Perceive Recognize Select	Adapt Adjust Alter Change Correct Customize Develop Improve Manipulate Modify Practice Revise	Build Compose Construct Create Design Originate Produce	Demonstrate Exhibit Illustrate Instruct Teach Train

Basic Knowledge  
 Basic Skills  
 Level

More Sophisticated Skills  
 Higher Level Abilities  
 Critical Understanding of Performance



Affective Domain

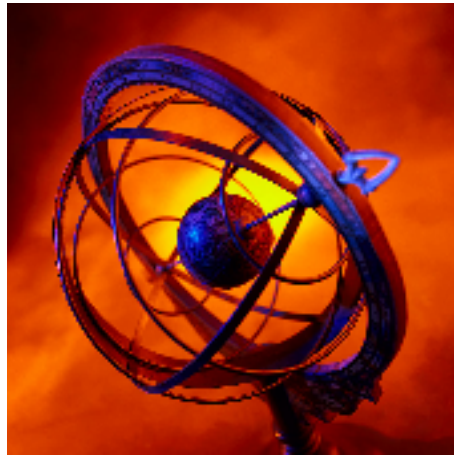
**Learning Outcomes Related To Attitudes, Behaviors, and Values**

<b>Receiving</b>	<b>Responding</b>	<b>Valuing</b>	<b>Organizing</b>	<b>Characterizing</b>
Students become aware of an attitude, behavior, or value.	Students exhibit a reaction or change as a result of exposure to an attitude, behavior, or value.	Students recognize value and display this through involvement or commitment.	Students determine a new value or behavior as important or a priority.	Students integrate consistent behavior as a naturalized value in spite of discomfort or cost. The value is recognized as a part of the person's character.
Accept Attend Describe Explain Locate Observe Realize Receive Recognize	Behave Comply Cooperate Discuss Examine Follow Model Present Respond Show Studies	Accept Adapt Balance Choose Differentiate Defend Influence Prefer Recognize Seek Value	Adapt Adjust Alter Change Customize Develop Improve Manipulate Modify Practice Revise	Authenticate Characterize Defend Display Embody Habituate Internalize Produce Represent Validate Verify

Elementary Values and Behaviors  
 Inherited Value System  
 Egocentric View

More Highly Developed Attitudes  
 Well Thought-out Value System  
 Higher Level Abilities to Identify and  
 Articulate Others' Values

*PROGRAM ASSESSMENT &  
STUDENT  
LEARNING OUTCOMES*



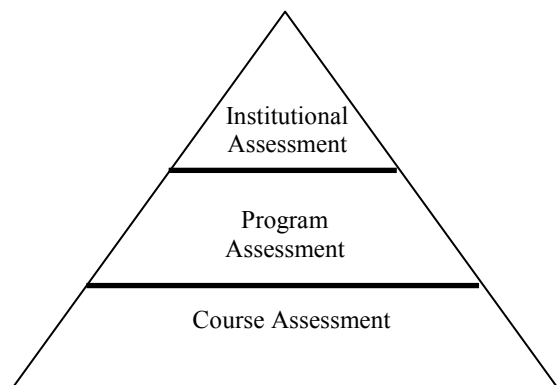
## Program Assessment

This section will explore program assessment by beginning with discussing an important fundamental question concerning defining and designing programs. This section will conclude with sample program assessment tools and reports.

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Linkage of course outcomes to program and institutional level outcomes is essential. The philosophy behind this website is based upon the concept that training faculty to articulate outcomes and develop assessment practices in their favorite courses will equip them to apply that expertise at program and institutional level assessment.

Program assessment is a more comprehensive endeavor and must be clearly focused on learning to produce improvement, rather than a report of the program details which is commonly the extent of Program Review activities. This section begins by looking at things from a different and broader perspective and then working through some of the details of program assessment in community colleges.



### **When writing program outcomes:**

- state the program purpose or mission
- consider other areas or programs that feed into or interact with your program
- analyze community expectations for the program
- survey program descriptors and accomplishments
- review the components of the program and
- determine participant expectations

### **Defining Programs**

The primary requirement for writing SLOs and designing program assessment is a clearly defined program with a written mission statement. Mission statements are not hard to create and the conversations are exceedingly useful.

Programs are often defined by departments and disciplines, or geographic locations, e.g. the biology department, physical science, humanities, the book store, and counseling. Viewing it from the student's perspective a program might be a pathway. For instance, the Bakersfield biology program really contained three pathways which were programs of study ending in or contributing to terminal degrees.

- the pathway or program for biology majors
  - requiring some pre- and co- requisites (math, chemistry, physics)
  - taking numerous interrelated courses with a discipline focus
  - typically transferring to a four year institution
- the biotechnology program
  - requiring pre-requisites
  - taking a lock-step series of courses to prepare for a profession
  - concluding with a vocational program and eventual board exam
- the general education program
  - requiring only collegiate level reading
  - serving as the only science portion to many student's education
  - concluding in a liberal studies degree (potential teachers) or as transfer degree in another discipline field or vocation

A discussion concerning programs must consider cross-disciplinary programs or degrees. Consider cross-disciplinary programs such as Global Studies or PACE which represents a unique, but stimulating challenge, which could greatly benefit students (and is somewhat reminiscent of learning communities).

*\*Warning: These discussions take time and examine the fabric of institutional organization and governance structures. However, the discussions provide a rationale for why things exist as they do, and an opportunity to review them concerning learning centered strategies. Allow time and be inclusive when examining these issues.*

## Writing a Mission Statement for a Community College Program

It is important to begin the process by developing a program mission statement. A mission statement explains what the program goal or goals are in a sentence or two. It is a simple statement that encapsulates the direction or purpose of the program.

Getting started:

These statements are best written with representatives from as many program participants as possible. Students, staff, faculty, and deans should meet to create this statement.

Step 1:

Brainstorm the activities of the program. List what the program does and how it does things. What makes the program unique? Why does this program exist? What are the defining characteristics of this program?

Step 2:

Begin by writing:

who you are  
what you do  
for whom  
and why

For example:

DRAFT Mission statement for the Bakersfield Pre-allied Health Biology program

The pre-allied health biology program prepares students for vocational health programs by providing rigorous courses and hands-on experiences in human biology.

Step 3:

Take this statement and modify it by asking questions.

Does this represent us?

Is this really what we do?

Is this all we do?

Does this include our unique features?

Does this include the aspects that make us successful?

Does everyone involved in the program understand the statement?

Does the statement suggest a vision and mission for the future?

Step 4:

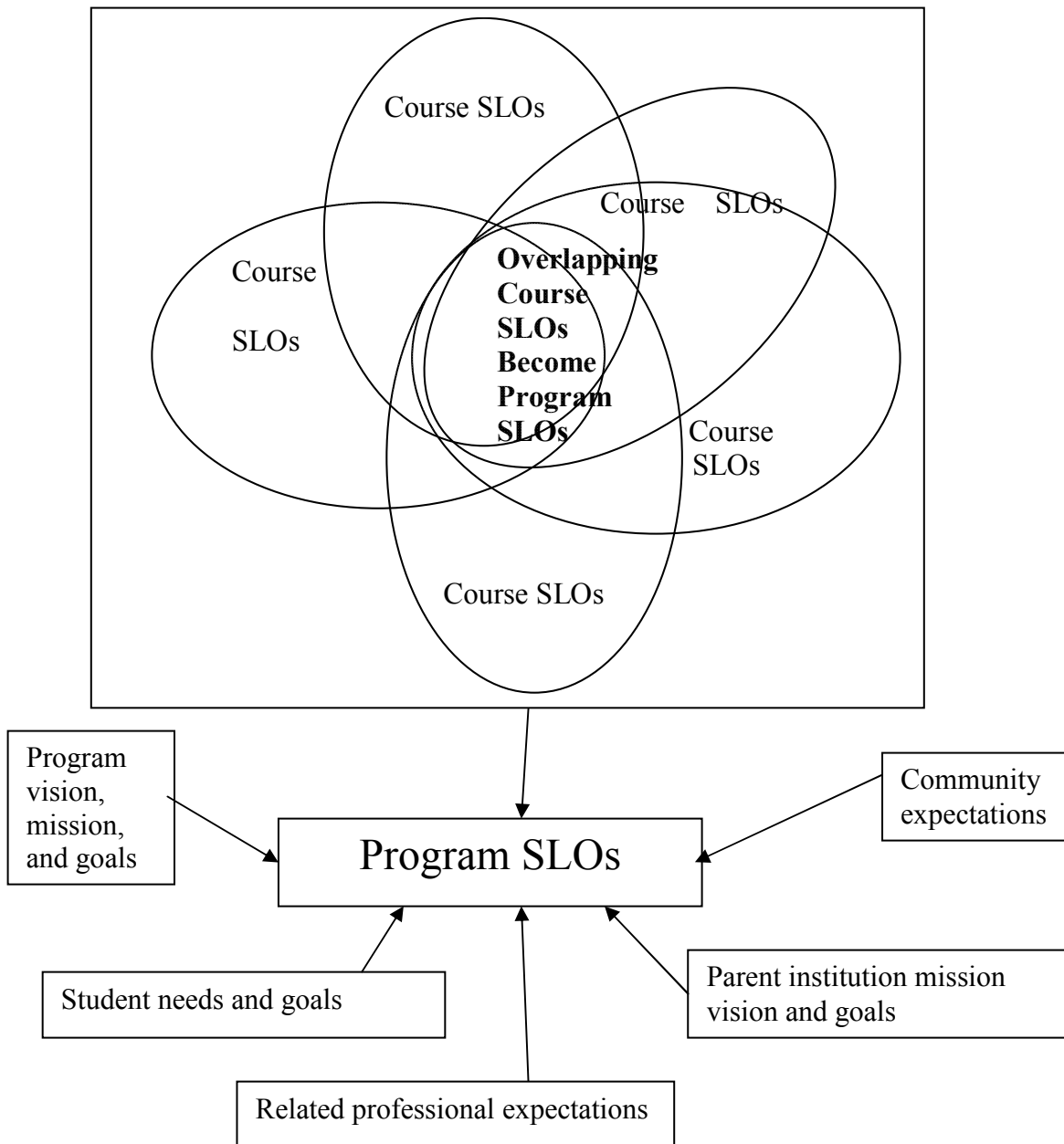
Compare your statement to other mission statements on line or other departments on your campus and modify again. Refine the statement so that it is clear and succinct.

The Bakersfield pre-allied health biology program prepares students for vocational health programs through rigorous coursework, hands-on lab experiences, and relevant field trips in human biology. Students learn to seek out and apply the appropriate information, think critically, develop communication skills, and value others.

**Modify the statement often so that it represents your program and the people in it.**

## Writing Program SLOs

Articulating the program goals, and coordinating the appropriate course SLOs, are important foundations in finalizing draft program SLOs. It is also important to consider external requirements or expectations after a program or course of study. This would include an analysis of: 1) the community or employer expectations, 2) professional standards and expectations, 3) alignment between course, program, and institutional outcomes, 4) student expectations and needs, and transfer institution expectations.



The goal is to explicitly state overarching outcomes that represent skills, knowledge, and abilities the students attain **as a result of the program of study**. This may include activities beyond course work (field trips, internships, volunteer experiences). Once again the SLO checklist should be useful.

Instructional Programs Outcomes	Student Services Programs Outcomes
Name a specific course or program	Name a specific program or service (e.g. counseling, financial aid, PSSD, Admissions and Records, etc.)
Are there any prerequisites for this course?	This program must interface with what other key areas?
Does this course serve as a prerequisite for any other courses?	
Purpose or Mission	Purpose, Mission, or Function that best describes this programs role in student learning:

Regardless of the organization, WASC requirements for General Education (GE) Programs are very explicit and it is important to review the implications of these standards. The next portion of this section involves GE assessment and then returns to traditional program assessment. Skip the next few pages if GE is not a concern for you. An example of linking courses to GE outcomes is in Appendix D.

## **General Education Program Assessment (Also referred to as Institutional Assessment)**

General Education refers to that course of study often called Liberal Studies or Inter-Disciplinary Studies and represents the majority of AA degrees granted in California Community Colleges and the set of core studies for most discipline specific degrees. Some combinations of these courses are also referred to as CSU Breadth Requirements, IGETC - Intersegmental General Education Transfer Curriculum, or the local institution's general education requirements. (Look in your institution's catalogue for specific courses approved for transfer and degrees.)

General Education requirements often define the unique character of US higher education institutions. Program outcomes will be highly variable depending upon program goals, the community expectations, the student population, and the institutional mission. ACCJC-WASC describes very specific standards which must be present in the core of all GE programs, I have summarized them below - the link in the resource section contains them in detail.

### Summary of GE Standards ACCJC-WASC Standard II.A.3.a-c

The GE program must publicize a philosophy and must include courses as part of the program based upon SLOs.

GE outcomes must include:

1. Basic discipline content and methodology for humanities, fine arts, natural sciences and social sciences.
2. Productive individual and life-long learner skills including oral and written communication, computer literacy, scientific and quantitative reasoning, critical analysis/logical thinking
3. Recognition of ethics and effective citizenry such as: interpersonal skills, appreciation of diversity, historical and aesthetic sensitivity, and civic responsibility.

Exact Standards Language is available at <http://www.accjc.org>

## Aligning Courses to Program SLOs

It is helpful to create a course matrix for the program SLOs. After writing SLOs a course matrix will easily identify program courses linked to the Program SLOs. It is also helpful to create a similar matrix displaying the relationship between program SLOs and Institutional or General Education SLOs.



Bakersfield CC Pre-Allied Health Program SLOs Matrix					
Course	SLO1	SLO2	SLO3	SLO4	SLO5
Math D					
Chemistry 11	X		X	X	X
Biology 14	X			X	X
Biology 15		X	X	X	
Biology 16	X		X		X
Medical Terminology	X				X

Examining SLOs using a matrix ensures that students have been introduced to the outcome, had formative feedback, and are summatively assessed concerning successful student learning. This process is somewhat more complicated when looking at GE outcomes across many disciplines, but essential.

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## Sample Program Assessment Reports

Data from program assessment should be aggregated to protect individual student privacy, individual faculty member's privacy, and individual course sections. The aggregated information is used when preparing unit, department, and institutional assessment reports. Use of the data must be clearly explained. (Will it effect grades, program completion, certificate or degree awards, or only be used for information?)

Program Assessment Reports are most useful when they are aligned with and incorporated into reports that can be integrated into program review and accreditation reports. A program assessment report should include aggregated data and be condensed to minimally include the essential elements shown in the template below.

Sample Program Assessment Report Template
Title of Program:
Program Mission or Goal:
Student Learning Outcomes:
Measurement Methods and Processes:
Data Summary (overview):
Use of Results (in decision making, curricular changes, etc.):
Timeline for Program Modifications or Response to Data:
Appendixes for supporting data

While some of these reports have varying length depending on the amount of supportive data included as evidence and the space required to write the SLOs, the reports are executive summaries of less than one page to a maximum of two pages in length excluding appendixes and Student Learning Outcomes statements.

Some institutions are using a simple table to report on each SLO as shown below.

Program Assessment Report      Department:						
Program SLO	Method of Assessment	Summary Data	Interpretation of Results	Positive Findings	Areas for Improvement	Timeline
SLO1						
SLO2						
etc						

Ultimately the overall report should be focused and indicate evidenced based modifications subsequent to the assessment. Program assessment, like course assessment, should focus on 1 or 2 SLOs per year. It is better to close the cycle on one SLO than to partially complete assessment and reporting for each SLO.

Student Learning Outcome Checklist	Yes	No
Do the SLOs include active verbs?		
Do the SLOs suggest or identify an assessment?		
Do the SLOs address the expected level of learning for the course using Bloom's Taxonomy as a guideline?		
Do the SLOs address more than one domain (cognitive, psychomotor, and affective)?		
Are the SLOs written as outcomes rather than as objectives? <ol style="list-style-type: none"> <li>4. Language indicates an important overarching concept versus small lesson or chapter objectives.</li> <li>5. Outcomes address what a student will be able to <b>do</b> at the completion of the course.</li> <li>6. SLOs address student competency rather than content coverage.</li> </ol>		
Are the SLOs appropriate for the course? <ul style="list-style-type: none"> <li>• Consistent with the curriculum document of record</li> <li>• Represents a fundamental result of the course</li> <li>• Aligns with other courses in a sequence, if applicable</li> <li>• Represents collegiate level work</li> </ul>		
Will students understand the SLOs?		
Comments or suggestions:		

Assessment Tool Checklist	
1.	Does the assessment adequately evaluate academic performance relevant to the desired outcome? (validity)
2.	Does this assessment tool enable students with different learning styles or abilities to show you what they have learned and what they can do?
3.	Does the content examined by the assessment align with the content from the course? (Content validity)
4.	Does this assessment method adequately address the knowledge, skills, abilities, behavior, and values associated with the intended outcome? (Domain validity)
5.	Will the assessment provide information at a level appropriate to the outcome? (Bloom's)
6.	Will the data accurately represent what the student can do in an authentic or real life situation? (Authentic assessment)
7.	Is the grading scheme consistent; would a student receive the <i>same</i> grade for the <i>same</i> work on multiple evaluations? (Reliability)
8.	Can multiple people use the scoring mechanism and come up with the same general score? (Reliability)
9.	Does the assessment provide data that is specific enough for the desired outcomes? (alignment with SLO)
10.	Is the assessment summative or formative - if formative does it generate diagnostic feedback to improve learning?
11.	Is the assessment summative or formative - if summative, is the final evaluation built upon multiple sources of data? (AAHE Good practice)
12.	If this is a summative assessment, have the students had ample opportunity for formative feedback and practice displaying what they know and can do?
13.	Is the assessment unbiased or value-neutral, minimizing an attempt to give desirable responses and reducing any cultural misinterpretations?
14.	Are the intended uses for the assessment clear? (Grading, program review, both)
15.	Have other faculty provided feedback?
16.	Has the assessment been pilot-tested?
17.	Has the evaluation instrument been normed?
18.	Will the information derived from the assessment help to improve teaching and learning? (AAHE Good Practice)
19.	Will you provide the students with a copy of the rubric or assignment grading criteria?
20.	Will you provide the students examples of model work?

## Resources

Allen, M.J. (2004). *Assessing academic programs*. Bolton, MA: Anker Publishing

Bers, T. (n.d.) *Assessment at the Program Level*. California Assessment Website at <http://cai.cc.ca.us/workshops/Prog Level Assessment by Bers.doc>

Creel, D.W. (n.d.). Northern Virginia Community College General Education Assessment <http://www.nv.cc.va.us/assessment/VAG Gen Ed/VAG Gen Ed.PPT>

Educational Testing Services at <http://www.ets.org/> for standardized testing.

Erwin, T.D. (2000). The NPEC sourcebook on assessment, volume 1: Definitions and Assessment methods for critical thinking, problem-solving, and writing. Download document from <http://nces.ed.gov/pubsearch/pubinfo.asp?pubid=2000195>

Moskal, B.M. & Blake, B.B. (2000). Developing a departmental Assessment plan: Issues and concerns. In *The department chair 11(1)*. Bolton, MA: Anker Publishing. Also available online at [http://www.acenet.edu/resources/chairs/docs/Moskal\\_and\\_Bath.pdf](http://www.acenet.edu/resources/chairs/docs/Moskal_and_Bath.pdf)

Southern Missouri State University. *Busy Chairpersons Guide for Departmental Assessment Reporting* at the SMSU website <http://www2.semo.edu/provost/assmt/1>

Upcraft, M.L. & Schuh, J.H. (1996). *Assessment in student affairs: A guide for practitioners*. San Francisco: Jossey-Bass.

### **Student Services Program Assessment Resources**

College Student Experiences Questionnaire  
<http://www.iu.edu/~cseq>

Community College Survey of Student Engagement  
<http://www.ccsse.org/>

Educational Testing Service (ETS)  
<http://www.ets.org>

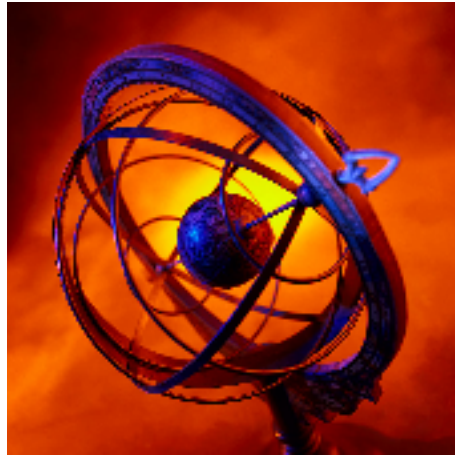
National Center for Higher Education Management Systems (NCHEMS)  
<http://www.nchems.org>

National Survey of Student Engagement (NSSE)  
<http://www.indiana.edu/~nsse>

Noel-Levitz  
<http://www.noellevitz.com>

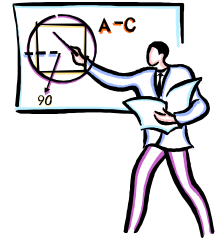
The Student Learning Imperative: Implications for Student Affairs  
<http://www.acpa.nche.edu/sli/sli.htm>

*ASSESSMENT TOOLS  
&  
DATA*



## Assessment Tools and Data

*“Classroom assessment is the purest form of assessment-for-improvement, because the information gleaned can be immediately used to improve teaching and learning ...the further away from the individual classroom you get, the harder it becomes to turn assessment data into useable information” (Miller, 1997).*



*“Post secondary assessment done right must be rooted in the course and in the classroom, in the individual cells, to speak metaphorically, where the metabolism of learning actually takes place” (Wright, 1999).*

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### Defining (and Re-assessing) Assessment: A Second Try

T. A. Angelo, (1995) AAHE Bulletin no.48, p.7.

*"Assessment is an ongoing process aimed at understanding and improving student learning. It involves*

- *making our expectations explicit and public;*
- *setting appropriate criteria and high standards for learning quality;*
- *systematically gathering, analyzing, and interpreting evidence to determine how well performance matches those expectations and standards; and*
- *using the resulting information to document, explain, and improve performance.*

*When it is embedded effectively within larger institutional systems, assessment can help us*

- *focus our collective attention,*
- *examine our assumptions, and*
- *create a shared academic culture dedicated to assuring and improving the quality of higher education. "*

This section addresses the types of tools and assessment methods which produce valid and reliable data. You may view this section as a smorgasbord of choices. When SLOs are well-written the method or tools for assessment become clear. One size does not fit all, so selecting the appropriate assessment tool requires a basic understanding of: 1) the types of tools available, 2) the nature of data, 3) the process used to select appropriate assessment tools, 4) and the tool's ability to investigate (measure, assess, describe) the observable learning outcome.

Working through this section will assist you in planning for and implementing assessment for the SLOs you have created. This section will describe assessment data and tools as well as compare and contrast the various types of assessment tools relevant to SLOs developed for a course or program.

You may have heard these quotes about statistics and data:

Torture numbers  
and they'll confess  
to anything.  
~Gregg Easterbrook

Statistics are like bikinis.  
What they reveal is  
suggestive, but what they  
conceal is vital.  
~Aaron Levenstein

Facts are stubborn  
things, but statistics are  
more pliable. ~Author  
Unknown

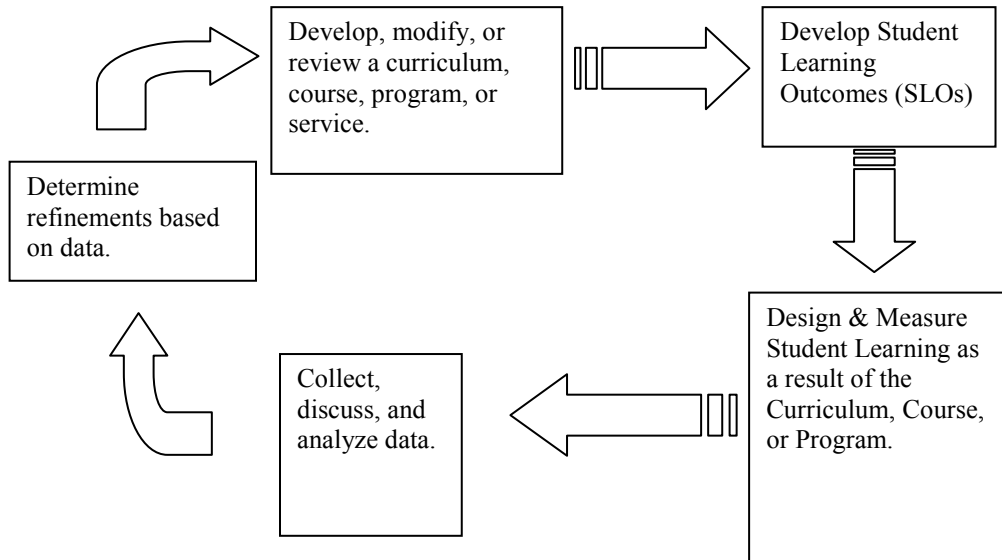
There are three kinds of lies - lies, damned lies and  
statistics. ~Benjamin Disraeli, commonly  
misattributed to Mark Twain because he quotes  
Disraeli in *Autobiography (Thank you, Will.)*

From the Quote Garden <http://www.quote garden.com/statistics.html>

## Quality Data

In the simplest definition, quality data are based upon best practices, answer important questions, and benefit the students and institution by providing evidence to complete the assessment loop.

### The Assessment Cycle



The assessment cycle is a data-driven method of decision-making based upon a learning paradigm where questions are posed concerning what works and what does not. To determine the answer to the questions an assessment or investigation is initiated. The investigation generates appropriate data to answer the question. When carried out as an integrated part of the educational process it is often referred to as the scholarship of teaching. By analyzing our teaching methods and learning outcomes, we can improve the process based on information gleaned through assessment, rather than running on intuition. The goal is to create a culture of evidence for institutional decision-making.

In this material, quality data are defined as :

**Valid** - the data accurately represents what you are trying to measure. For instance the numbers of people that graduate don't necessarily represent good data on what has actually been learned.

**Reliable** - the data are reproducible. Repeated assessment yields the same data.

**Authentic** - the assessment simulates real-life circumstances.

**Relevant** - the data answers important questions, and is not generated simply because it is easy to measure.

**Effective** - the data contributes to improving teaching and learning.

## Types of Assessment Data and Assessments

*These definitions are paired for emphasis and contrast.  
Skim them now and refer to them if they are needed later.*



### **Evidence of program and institutional outcomes performance.**

Quantitative or qualitative, direct or indirect data that provides information concerning the extent to which an institution meets the goals and outcomes it has established and publicized to its stakeholders.

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**Direct data.** Direct data measures the exact value. For instance, a math test directly measures a student's learning in math by defining a criteria and standard, then having the student analyze a problem.

**Indirect data.** Data that measures a variable related to the intended value. For instance a person's math skills may be indirectly measured through an employers questionnaire asking about the computational skills of graduating students.

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**Qualitative data.** Data collected as descriptive information, such as a narrative or portfolio. These types of data, often collected in open-ended questions, feedback surveys, or summary reports, are more difficult to compare, reproduce, and generalize. It is bulky to store and to report; however, it is often the most valuable and insightful data generated, often providing potential solutions or modifications in the form of feedback.

**Quantitative data.** Data collected as numerical or statistical values. These data use actual numbers (scores, rates, etc) to express quantities of a variable. Qualitative data, such as opinions, can be displayed as numerical data by using Likert scaled responses which assigns a numerical value to each response (e.g. 5 = strongly agree to 1 = strongly disagree). This data is easy to store and manage; it can be generalized and reproduced, but has limited value due to the rigidity of the responses and must be carefully constructed to be valid.

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**Formative assessment.** Formative evaluation involves assessment and analysis that generates useful feedback for development and improvement. The purpose is to provide an opportunity to perform and receive guidance (such as in class assignments, quizzes, discussion, lab activities, etc.) that will improve or shape performance on a final or summative evaluation.

**Summative assessment.** Summative evaluation is a final determination of particular knowledge, skills, and abilities. This could be exemplified by exit or licensing exams, senior recitals, or any final assessment which is not created to provide feedback for improvement, but is used for final judgments.

---

**Criterion-based assessments.** Assessment evaluated or scored using a set of criteria to appraise or evaluate work. Criterion-referenced evaluation is based on proficiency not subjective measures such as improvement.

**Norm-referenced assessment.** Assessment of an individual is compared to that of another individual or to the same individual's improvement over time. Individuals are commonly ranked to determine a median or average. This technique addresses overall mastery, but provides little detail about specific skills.

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**Embedded assessment.** Embedded assessment occurs within the regular class or curricular activity. Class assignments linked to student learning outcomes through primary trait analysis, serve as grading and assessment instruments. Individual questions on exams can be embedded in numerous classes to provide departmental, program, or institutional assessment information. An additional benefit to embedded assessment is immediate feedback on the pedagogy and student needs.

**Standardized assessment.** Assessments created, tested, and usually sold by an educational testing company e.g. GRE's, SAT, ACT for broad public usage and data comparison, usually scored normatively.

**Homegrown or Local assessment.** This type of assessment is developed and validated for a specific purpose, course, or function and is usually criterion-referenced to promote validity.

The next section will discuss some of the advantages and disadvantages of standardized assessments as compared to local or homegrown assessments.

## Comparing Standardized and Homegrown or Local Assessments

Opinions about standardized testing and local tests are colored by experiences with these tools. Below is a summary comparison of these instruments. There are many types of standardized tests available, everyone is familiar with the SAT and GRE. However, there are discipline specific standardized tests, and standardized tools to collect data on student, faculty, and community perceptions for student services areas. Links in the research section represent fairly opinionated positions for and against standardized testing.

	<b>Standardized Assessments</b>	<b>Homegrown or Local Assessments</b>
<b>Source</b>	Externally created and validated instruments, with an established format, administered under controlled conditions.	Internally created and validated instruments, usually developed by faculty requiring extra time and expertise.
<b>Methodology Face Value</b>	May appear formulaic. Requires extra care to incorporate higher level thinking skills.	May appear unreliable. Requires extra care to incorporate validity and reliability.
<b>Reporting Format</b>	Manageable, commercial report generated, sometimes customizable.	Manageability depends on tool and design. Report is prepared by a local committee or institutional research office.
<b>Data collection</b>	Direct and indirect, predominantly quantitative data.  Very limited or no flexibility.	Direct and indirect, qualitative and quantitative data  Very flexible.
<b>Comparability of Data</b>	Provides systematic and comparable data over time between students, courses, & institutions..	Generally not comparable except between those who agree to use same tool without modifications.
<b>Assessment Basis</b>	Common general educational objectives or standards.	Based on specifically identified and valued local educational outcomes.
<b>Domains Evaluated</b>	Cognitive and opinion surveys generate affective information.	Cognitive, affective, and psychomotor.
<b>Level of information</b>	Tends to be lower level recall of knowledge and some comprehension.	Can potentially target all levels and all domains.
<b>Viability in changing fields</b>	Limited due to the process of generating and validating test questions	May be regularly updated
<b>Examples</b>	ACT, PSAT, SAT, ASSET, TOEFL TSE, TWE, LSAT, MCAT, GRE, DSST	MESA College General Education tests, Embedded testing
<b>Accountability/Improvement</b>	Summative – Accountability  Little help in improvement of education	Formative and summative – accountability and improvement. Immediate feedback to all parties.
<b>Other Comments</b>		

## Grading and Assessment



### ***But how does assessment fit with GRADING?***

*Paul Dressel (1976) has defined a grade as "an inadequate report of an inaccurate judgment by a biased and variable judge of the extent to which a student has attained an undefined level of mastery of an unknown proportion of an indefinite material." Miller, Imrie, & Cox 1998, p. 24*

*"An interesting aspect of the GPA is that it tells us very little about what a student knows or what that student's competencies or talents really are. The GPA is thus primarily a relativistic or normative measure. That is, the primary information contained in a course grade pertains to the student's performance in relation to other students." Astin, 1993, p. 11*

Walvoord and Anderson (1998) in their book [\*Effective Grading\*](#) suggest that grading, when based upon explicit criteria, can become a structural framework for course embedded assessment. This creates a criterion-referenced and valid means of assessing student learning that occurs in the process of teaching, rather than as an additional task layered upon daily course activities.

## Effective Grading Ideas

**Make the course assignment-centered.** Do not ask, "What should I cover in this course?" but "What should my students be able to do?"

- **Rethink the use of in-class time.** (What wastes your time or the students' time? Assess the competency of your students at the beginning; some may be lacking in pre-requisite skills)
- **Give students explicit directions for each assignment.** (This saves you time grading and allows students to create a better product.)
- **Determine assessable criteria, use grading scales, checklists, or rubrics that are assignment-specific.** Construct a Primary Trait Analysis (PTA) scale referencing highly explicit criteria and develop rubrics based upon the PTA.
- **Make grading time-efficient.** (Grade things to a certain point in the paper; if the same mistakes are occurring repetitively, draw a line and indicate this is a systemic recurring problem and that you have stopped making specific comments. Use a checklist for simple content or components of assignments, but provide detailed feedback for formative development.)
- **Use authentic types of assignments.**
- **Employ multiple types of assessments.**
- **Address a variety of learning styles.**

In the process of rethinking assignments to make them valid and reliable assessments, faculty grading becomes more efficient and effective, and student performance improves due to the explicit expectations that faculty have articulated. The next sections discuss assignments and exams based upon standards and criteria using primary trait analysis.

## Primary Trait Analysis and Rubrics

**Definition:** Primary Trait Analysis (PTA) is the process of identifying major traits or characteristics that are expected in student work. After the primary traits are identified, specific criteria with performance standards, are defined for each trait.

On the next page is a flow chart of an example that incorporates a general education outcome (oral communication) within a science specific course-embedded assessment. The assignment is an oral report on a current controversial biological topic. Rather than intuitively grading the oral report specific traits or characteristics are identified.

The primary traits and performance standards should be discussed with other faculty to obtain feedback. Faculty from other disciplines often provide excellent feedback. Healthy discussion validates and clarifies your thinking.

The next step is to develop a rubric used to score the student performance. A rubric is a grading tool used to assign points or values for meeting performance criteria. The rubric will be given to the student when the assignment is announced.

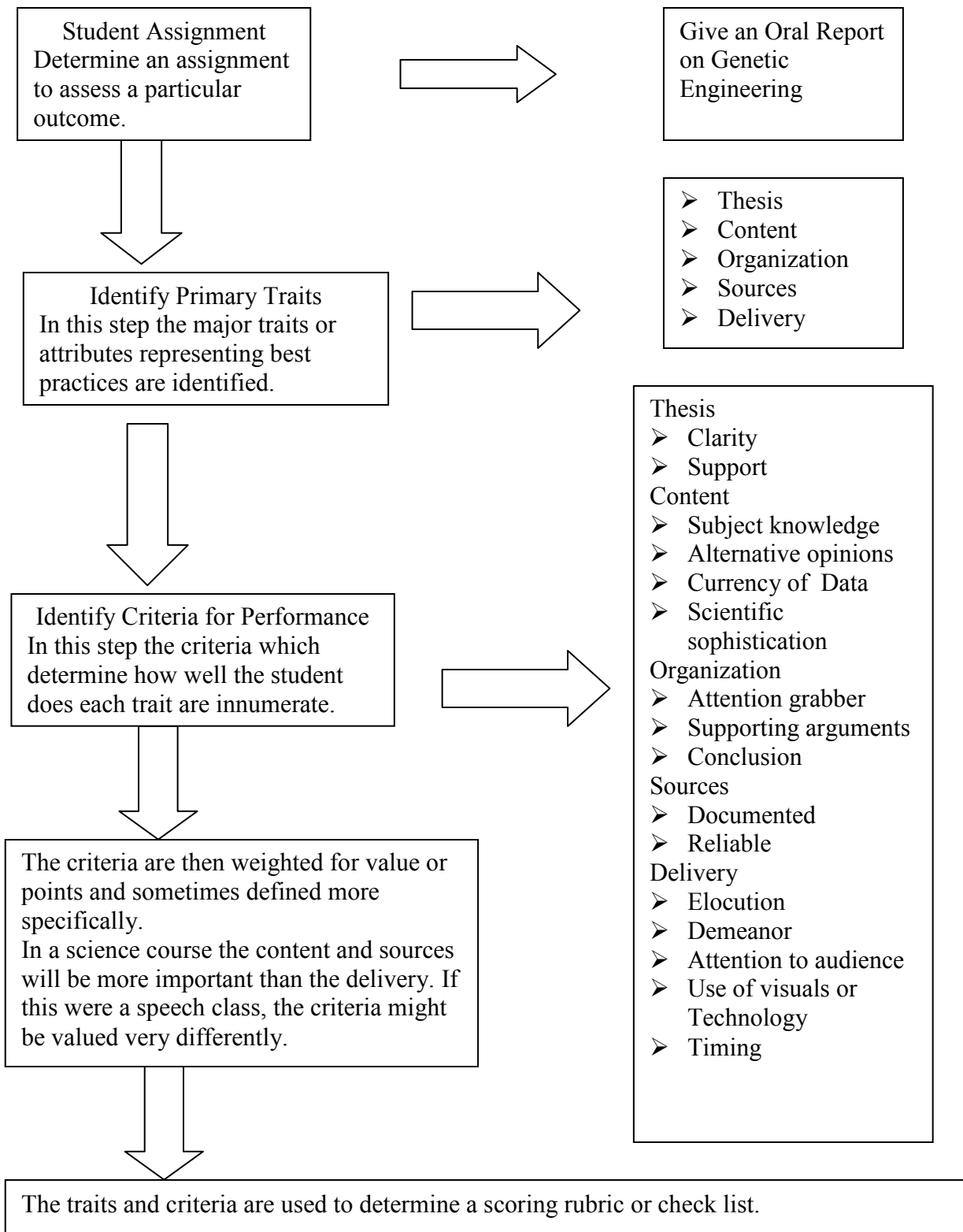
Discuss the primary traits with other faculty for feedback. It is helpful to discuss it with faculty from other disciplines. This validates and clarifies your thinking.

The next step is to develop a rubric. A rubric is a grading tool used to assign points or values for meeting performance criteria.

Rubrics are useful because they help to:

1. Focus instruction on the most important outcomes.
2. Provide diagnostic formative feedback so students can improve.
3. Communicate explicit expectations.
4. Connect the assessment to the assessment increasing validity as an assessment tool.
5. Articulate how scoring is determined; provide a rationale for grading accountability.
6. Produce more consistent and reliable grading.

## Example of Primary Trait Analysis for an Oral Report in a Science



## Creating a Rubric for an Oral Report in a Science Course

Primary Traits

Values – some people describe these, others assign numbers

Performance Criteria – some people make comments or just give checks, others describe each level explicitly.

Expectations		Excellent 5	Good 4	Average 3	Poor 2	Absent 1
Thesis	clarity					
	support					
Content	subject knowledge					
	alternative opinions	Two or more opposing opinions are described	An opinion differing from the students is described	The student admits others have differing opinions	Only the student's opinion is described	No opinions are evident
	currency of data					
	scientific sophistication					
		3	3	2	1	1
Organization	attention grabber					
	supporting arguments					
	conclusion					
Sources	cited correctly					
	reliability					
Delivery	pronunciation					
	eye contact					
	use of visuals					
	demeanor					
	content appropriate to audience					
		5	5	5	3	0
Timing						

You may want to vary the weight of some criteria.

Several sample rubrics are included in the appendix.

## Choosing the Right Assessment Tools

Examples of various assessment tools are included in the table below. Evaluate each type of assessment with regards to the type of data generated by the assessment and the pros and cons associated with the assessment. This exercise will stimulate some thought about the pros and cons of each assessment, and review your understanding of the types of data. Answers may vary depending upon your perspective and the way in which you construct the assessment.

Assessment Tool	D or I	C, P or A	F or S	Bloom's K, C, A, ASE	Pros	Cons
	Direct Indirect	Cognitive, Psychomotor, Affective	Formative or Summative	Knowledge, Comprehension, Application or Analysis/synthesis /evaluation		
Multiple Choice Exam	D	C	F & S	K, C, A	easy to grade objective	reduces assessment to multiple choice answers
Licensing Exams						
Standardized Cognitive Tests						
Checklists						
Essay						
Case Study						
Problem Solving						
Oral Speech						

Assessment Tool	D or I	C, P or A	F or S	Bloom's K, C, A, ASE	Pros	Cons
	Direct Indirect	Cognitive, Psychomotor, Affective	Formative or Summative	Knowledge, Comprehension, Application or Analysis/synthesis /evaluation		
Debate						
Product Creation & Special Reports						
Flowchart or Diagram						
Portfolios						
Performance						
Capstone Course						
Team Project						
Reflective self- assessment essay						
Satisfaction or Perception Surveys						

**Some potential answers to the table are in Appendix B and Appendix C has samples and links to assessments.**

## Choosing the Right Assessment Tools

This section has discussed the use of standardized assessments and local or homegrown assessments. There are advantages to using each depending on the circumstances and the way that they are constructed. Multiple choice questions are often seen as assessing only lower cognitive levels (recall and perhaps comprehension). However you can construct multiple choice questions that require analytical or synthetic thinking.

For example, if I want to see if my students can use the microscope, I can write some higher level thinking multiple choice questions that force the student to solve a problem. For instance,

Imagine that you are observing a malaria smear under the microscope at a total magnification of 1000X. The object appears dark and it is difficult to see the detail of the red blood cells. What is the first step you would take to solve the problem?

- a. Check the interface between oil on the slide and the lens.
- b. Look at each lens for dirt or smudging.
- c. Adjust the position of the diaphragm and light source or condenser.
- d. Select another slide with better staining quality.

However, if an outcome of the class is that the students will be able to use a microscope to focus on an object, this question does not authentically test that outcome. The best way to test the outcome is to give the students a slide, have them focus on the object as clearly as they can, write down an identification of an object indicated by the microscope pointer, and then call me over to evaluate their work.

This is also more efficient class management.

- I am able to give the students immediate feedback.
- Students can immediately identify and correct problems.
- I know what the students are capable of doing and how to proceed with the next material.
- Students either feel confident about their ability or know that they must come in for extra help.
- The assessment is graded and returned during the class time.

## Create an Assessment Tool



**Now it is your turn to select a tool from the previous table, convert something you already use, or create an assignment that could be used for an embedded assessment tool that aligns with one of the SLOs you have written.**

1. Look at the SLOs for your favorite course. Do a mini-assessment audit. Are there any assignments, projects, or exams that provide good data on a specific student learning outcome? If not, you may need to create a new assignment. Determine which type of assessment tool best assessed that the student can DO the outcome. This should be authentic; closely resembling a real life experience. Will the student perform a task, create a product, analyze a case study, recite detailed information, or solve a problem?
2. Identify the purpose of the assessment. Will it be formative or summative? If it is formative, how will feedback be given? Will you use it to provide feedback from other students as well as yourself? If summative, has the student had ample practice and feedback to do what is expected?
3. Do Primary Trait Analysis (PTA). Identify the major traits that determine a successful outcome. (For important projects this can be created with the students thus becoming a powerful teaching tool engaging the students and fully informing them about the expectations. *Warning* - collaborating with students can be time consuming; use this for important or high stakes assignments/assessments.)
4. Describe the criteria relating to the traits and create a checklist, rubric or set of descriptive performance standards. Consider psychomotor, affective and cognitive outcomes. Set criteria at the appropriate level of thinking (Bloom's taxonomy).
5. Create a grading rubric by weighting the criteria appropriately. Do not include attendance or improvement as a criterion. The criteria should be standards-based, not norm-referenced. Look at samples of artifacts to determine the criteria. Try the rubric out on student work and make appropriate modifications.
6. Use the Assessment Tool Checklist (just after the worksheet) to evaluate the assessment tool you have selected or created. Modify the tool appropriately.
7. Share the tool with other faculty and get feedback.

# Creating Graded Assignments as Embedded Assessment Tools



Class or Program:



SLO to be assessed:



What are the primary traits in this assignment that will make it a good assessment of the outcomes?



Describe the assessment; include the instructions for the students.

Is this a formative or summative assessment? If formative how will you provide feedback? If summative, has the student had an opportunity to practice and receive feedback?

What criteria will be used to evaluate the student's performance? Do not include attendance or improvement as a criterion.

---

Create a rubric or checklist using the criteria above. What performance standards will you use? Look at professional samples for ideas. Try the rubric out on student artifacts and then modify as needed. Weight the criteria appropriately.

Assessment Tool Checklist		<input checked="" type="checkbox"/>
21.	Does the assessment adequately evaluate academic performance relevant to the desired outcome? (validity)	
22.	Does this assessment tool enable students with different learning styles or abilities to show you what they have learned and what they can do?	
23.	Does the content examined by the assessment align with the content from the course? (Content validity)	
24.	Does this assessment method adequately address the knowledge, skills, abilities, behavior, and values associated with the intended outcome? (Domain validity)	
25.	Will the assessment provide information at a level appropriate to the outcome? (Bloom's)	
26.	Will the data accurately represent what the student can do in an authentic or real life situation? (Authentic assessment)	
27.	Is the grading scheme consistent; would a student receive the <i>same</i> grade for the <i>same</i> work on multiple evaluations? (Reliability)	
28.	Can multiple people use the scoring mechanism and come up with the same general score? (Reliability)	
29.	Does the assessment provide data that is specific enough for the desired outcomes? (alignment with SLO)	
30.	Is the assessment summative or formative - if formative does it generate diagnostic feedback to improve learning?	
31.	Is the assessment summative or formative - if summative, is the final evaluation built upon multiple sources of data? (AAHE Good practice)	
32.	If this is a summative assessment, have the students had ample opportunity for formative feedback and practice displaying what they know and can do?	
33.	Is the assessment unbiased or value-neutral, minimizing an attempt to give desirable responses and reducing any cultural misinterpretations?	
34.	Are the intended uses for the assessment clear? (Grading, program review, both)	
35.	Have other faculty provided feedback?	
36.	Has the assessment been pilot-tested?	
37.	Has the evaluation instrument been normed?	
38.	Will the information derived from the assessment help to improve teaching and learning? (AAHE Good Practice)	
39.	Will you provide the students with a copy of the rubric or assignment grading criteria?	
40.	Will you provide the students examples of model work?	

## Assessment Examples

Multiple Choice Exams - Many faculty and most standardized tests use the multiple choice format for assessments. The Educational Testing Service uses this for CLEP (College Level Examination Program) and College Level Field Tests etc <http://www.ets.org/tests/ctest.html>

There are discipline specific standardized multiple choice tests for college credit such as chemistry tests supplied by ETS [http://sydneyplus.ets.org/query.asp?FieldGUID=.ea85e0a4-4f31-4101-818f-01c336e9e4b1&SearchTerm=Chemistry&SearchType=16&CurSort=1&SelField=&mode=public&TemplateGUID=f1273652-1c89-4feb-b4ed-aa5525c2792b&RootTemplateGUID=f1273652-1c89-4feb-b4ed-aa5525c2792b&form\\_id=&fld\\_id=&page=1&SubmitBtn=Search&hpp=10](http://sydneyplus.ets.org/query.asp?FieldGUID=.ea85e0a4-4f31-4101-818f-01c336e9e4b1&SearchTerm=Chemistry&SearchType=16&CurSort=1&SelField=&mode=public&TemplateGUID=f1273652-1c89-4feb-b4ed-aa5525c2792b&RootTemplateGUID=f1273652-1c89-4feb-b4ed-aa5525c2792b&form_id=&fld_id=&page=1&SubmitBtn=Search&hpp=10)

In addition many of the entrance or placement tests are multiple choice.

Licensing Exams - There are licensing exams required for numerous professional licenses. For this reason it is appropriate to have assessments simulating these types of exams in a course.

NCLEX (nursing)

X-Ray Board Exams

[ASE Automotive Service Excellence Exam](#)

CNA - Certified Nursing Assistant

EMT - Emergency Medical Technician

Standardized Cognitive Tests - GRE, SAT, LSAT, MCAT, Miller's Analogies, Stanford-Binet etc

Checklist- A checklist basically determines whether a criterion is present or not, in contrast to how well or at what performance level. Checklists are good for simple psychomotor skills or low level recall.

Hand washing Checklist	<input checked="" type="checkbox"/>
Adjusted to appropriate water temperature	<input type="checkbox"/>
Hands wetted	<input type="checkbox"/>
Soap applied	<input type="checkbox"/>
Lather worked-up	<input type="checkbox"/>
Applied cleansing friction of at least 20 seconds	<input type="checkbox"/>
Applied friction between fingers	<input type="checkbox"/>
Applied friction on back of hands	<input type="checkbox"/>
Used fingernail brush for nail beds	<input type="checkbox"/>
Rinsed off all soap	<input type="checkbox"/>
Dried appropriately	<input type="checkbox"/>

Other sample checklists are linked below

Web content checklist (scroll down) <http://www.w3.org/TR/1999/WAI-WEBCONTENT-19990505/full-checklist.html>

Web accessibility <http://www.webaim.org/standards/508/508checklist.pdf>

Web page evaluation <http://www.lib.berkeley.edu/TeachingLib/Guides/Internet/EvalForm.pdf>

Study Skill Checklist <http://www.ucc.vt.edu/stdysk/checklis.html>

Skills Checklist for immunizations with values included <https://www.immunize.org/catg.d/2020skill.pdf>

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### Case Study & Problem Solving

Case studies use an "in situ" approach to simulate real life situations and problems. The National Center for Case Study Teaching in Science is a good example of pre-packaged assessments and assignments that can be adapted in a variety of courses <http://ublib.buffalo.edu/libraries/projects/cases/case.html>

Also checkout Engineering case studies <http://www.civeng.carleton.ca/ECL/>

and ethics case studies <http://ethics.sandiego.edu/resources/cases/HomeOverview.asp>

Problem Solving uses the same approach but may leave more developmental problem solving to the student. For instance, the student must develop the experiment or tests to obtain data. Rice University has a great collection of these. <http://www.ruf.rice.edu/~lane/rvls.html>

University of Delaware has sample problems

<http://edweb.sdsu.edu/clrit/learningtree/PBL/webassess/WebAssessmentHome.html>

Samford University has a website describing PBL - Problem based learning

<http://www.samford.edu/pbl/definitions.html>

SDSU has a site on assessing problem based learning

<http://edweb.sdsu.edu/clrit/learningtree/PBL/webassess/WebAssessmentHome.html>

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### Team Projects

This is another term for collaborative projects, either within the course, in conjunction with other courses, or with community partners. It uses collaborative learning to assess multiple levels of understanding and application. Many of the assessments above can be conducted in teams or collaboratively. There is, however, a difference between collaborative and cooperative.

[http://www.cpcs.umb.edu/partners\\_projects/partners\\_projects\\_collaborations.htm](http://www.cpcs.umb.edu/partners_projects/partners_projects_collaborations.htm)

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### Flowchart or Diagram

A flowchart is a visual or graphic illustration of a process or system used to solve a problem or produce a product. Cognitive researchers have said that placing information in a flowchart or diagram represents one of the highest levels of cognitive achievement requiring analysis and synthesis of many concepts. Flowcharts are excellent ways to communicate the logic involved in a system; students must recall the appropriate information and associated content but must also analyze how the components fit with the entire system or process. Flow charts allow students the opportunity to gain confidence in their ability to describe the entire system or process. Follow-up case study questions concerning the system or process, involving potential problems or adaptations, allow the students to use the flowchart to evaluate system changes.

Directions for this type of assessment must be very specific.

1. Describe a process using a flowchart or diagram. A flowchart is a visual or graphic illustration of a process or system used to solve a problem or produce a product.
2. Chart the process the way it really occurs.
3. Prepare a single lined title for the flowchart or diagram that adequately describes the process being described.
4. Begin with an event that initiates the process.
5. Record each succeeding action or reaction clearly identifying its relationship to the process.
6. Use standard symbols for reoccurrences
7. If multiple stimulators or multiple consequences occur, try to include these.
8. Make notes or reference anything that needs explanation and any assumptions that are not evident.
9. Determine and end point or whether the process is cyclic and draw it in this way.
10. Run through the flowchart to be sure you have not left anything out and that it flows in the way you have drawn it.

W.E. Deming, the quality guru is reported to have said, ""Draw a flowchart for whatever you do. Until you do, you do not know what you are doing, you just have a job." In the same way we might tell our students to draw a flow chart, until they do they have only memorized factoids.

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## Portfolios

Portfolios are a collection of student artifacts over a period of time.

<http://webcenter1.aahc.org/electronicportfolios/index.html>

Sample of a digital portfolio for students

[http://www.hpcnet.org/upload/attachments/TheDAT\\_392877\\_20031103082323.doc](http://www.hpcnet.org/upload/attachments/TheDAT_392877_20031103082323.doc)

Numerous samples of portfolios for student grading are found at

<http://www.aahc.org/teaching/pfoliosearch3.cfm>

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## Capstone

A capstone is defined as a culminating event or crowning achievement. Capstone Courses or Projects are high stakes courses or projects integrating multidisciplinary education with a problem or course. These are usually a requirement for transferring or graduating students. Capstones are good opportunities to evaluate programs.

Example of capstone projects in General Education <http://genedhonors.binghamton.edu/projdes.html>

Capstone Course in Education

[http://www.wgu.edu/wgu/smartcatalog/class\\_description.asp?course\\_key=7033](http://www.wgu.edu/wgu/smartcatalog/class_description.asp?course_key=7033)

Sample Capstone Projects <http://www.unomaha.edu/~wwwpa/project/prevsemesters.html>

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## Reflective Self-Assessment Essay

These types of essays ask the students to assess their own growth and development using evidence to support their conclusions.

An example of this kind of essay is given below. This essay is from a multidisciplinary capstone class in Advanced Composition and Critical Thinking taught by four instructors at Bakersfield College. The assignment is

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### Satisfaction or Perception Surveys

There are numerous commercial standardized assessments available to gather data on student, faculty, staff, employer, and community satisfaction or perceptions. Examples are the

CCSSE and NSSE on student engagement

Noel-Levitz SSI (Student Satisfaction Inventory)

CSEQ College Student Experiences Questionnaire

## Resources

- Angelo, T.A. (1995b). Reassessing (and Defining) Assessment. *Assessment Bulletin*, 48(3), 7.
- Angelo, T.A. (May, 1999). *Doing Assessment As If Learning Matters Most*.  
<http://aahebulletin.com/public/archive/angelomay99.asp>
- Bond, L.A. (1996) *Norm- and Criterion-Referenced Testing*. At PARE online  
<http://pareonline.net/getvn.asp?v=5&n=2>
- California Assessment Institute at <http://cai.cc.ca.us/>
- Dressel, P. quoted (p. 24) from Miller, A.H., Imrie, B.W., & Cox, K. (1998). *Student assessment in higher education: A handbook for assessing performance*. London; Kogan Page.
- Educational Testing Service <http://www.ets.org/tests/ctest.html>
- Erwin, T.D. (2000). The NPEC sourcebook on assessment, volume 1: Definitions and Assessment methods for critical thinking, problem-solving, and writing. Download document from  
<http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2000195>
- Fair Testing website. *The Limits of Standardized Testing*.  
<http://www.fairtest.org/facts/Limits of Tests.html>
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<http://www.fairtest.org/univ/univfactsheets.htm>
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<http://www.ericfacility.net/ericdigests/ed401595.html> (ERIC Document number ED401595)
- Leskes, A. (2002). *Beyond Confusion: An Assessment Glossary*. At the AACU website  
<http://www.aacu.org/peerreview/pr-sp02/pr-sp02reality.cfm>
- Levisque, Bradby, Rossi, MPR Associates (1996). Using Data from Program Improvement: How Do We Encourage Schools To Do It? <http://ncrve.berkeley.edu/CenterFocus/CF12.html>
- Math League (2001). Elementary, help with data and statistics  
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- National Research Council [NRC]. (2000). *How people learn: Brain, mind, experience, and school*. Washington, DC: [National Academy Press](#).
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- Rudman, H.C. (1999) *Integrating Testing with Teaching*. <http://pareonline.net/getvn.asp?v=1&n=6>
- Rudner, L.M. (1994) Questions to Ask When Evaluating Tests. Eric Document number ED385607  
[http://www.ericfacility.net/databases/ERIC\\_Digests/ed385607.html](http://www.ericfacility.net/databases/ERIC_Digests/ed385607.html) and PAREonline
- Walvoord, B. E. & Anderson, V.J. *Effective Grading: A Tool for Learning and Assessment*. San Francisco, CA: Jossey-Bass. 1998.
- Wiggins, G. (1990). *The Case for Authentic Testing*. at <http://pareonline.net/getvn.asp?v=2&n=2>

## *Why Assessment?*

# *History, Background, and Definitions*



## **What is Assessment?**

Assessment is the means to improve curriculum, make pedagogy more effective, challenge students to take ownership of their own learning, and produce deeper learning. New research in cognitive science (how people know things) is rapidly expanding; assessment helps implement these principles into classroom pedagogy. In addition, many fields of study, such as Biochemistry and Microbiology, are literally exploding with new information. Assessment provides a tool to incorporate current aspects of the discipline yet keep teaching focused.



**Assessment in higher education involves four important processes:**

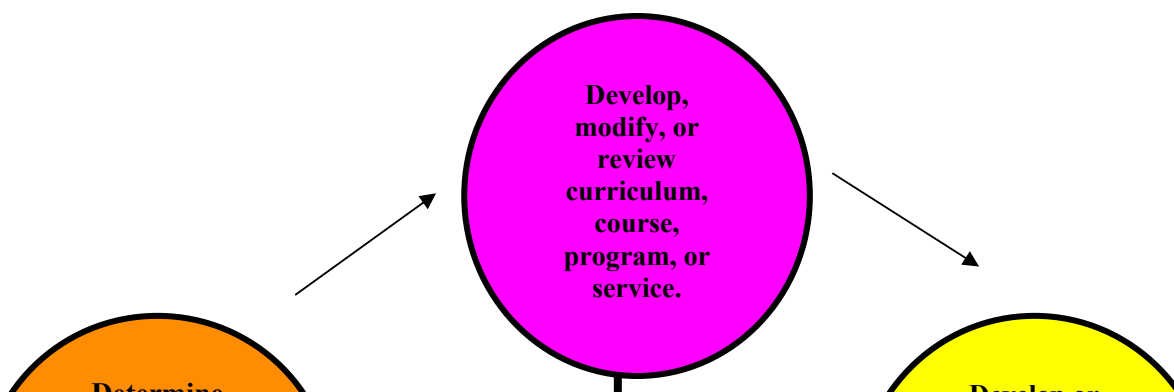
- identifying clear, valid, and appropriate student learning outcomes
- collecting evidence that those outcomes are being addressed
- dialogue to attain a collective interpretation of the data
- using data to improve both teaching and learning

**Defining Assessment:** The Accrediting Commission for Community and Junior Colleges, ACCJC-WASC, which accredits colleges in California, Hawai'i, and the Pacific Region, defines assessment as “the methods that an institution employs to gather evidence and evaluate quality” (<http://www.accjc.org>). Appendix B has more detailed definitions of assessment.

**Student Learning Outcomes (SLOs)** are statements which define what a student should be able to do after the completion of a course or program. The SLO defines what will be measured and dictates what assessment tool is appropriate. SLOs represent both the target for our service or teaching and the expectation for student achievement as a result of our effort. Assessment information tells us what students can do and how well they have learned as a result of a course or program. It informs us about the effectiveness of our pedagogy. Assessment data provides a culture of evidence which is the foundation for modification in teaching or service and further revisions to SLOs.

At first glance, assessing outcomes may appear threatening, because we are not miracle workers: not all students will succeed. Some students do not care and some do not try. However, we know that many students do learn, do care, and do pass our courses and complete programs. These are the students we want to engage most effectively. How can we improve the quality of learning that occurs for the majority of students in our programs and courses? It begins by using evidence (data) to make those improvements. The process of articulating desired outcomes, assessing those outcomes, and using the data for improvement, is called the assessment life cycle.

## Assessment Cycle\*



\* While the Assessment cycle is continuous, as we engage in this ongoing process, we will begin with Developing Student Learning Outcomes.

### **Why Assessment?**

The literature describes three main purposes for assessment.

- Assessment for accountability
- Assessment to improve learning
- Assessment as a tool for learning

Annually billions of public tax dollars are invested in higher education based upon the belief that education is a key factor in the health and economics of any country, state, or individual. However public demands for accountability have resulted in major concerns about the quality of American

higher education. In 1983 a U.S. Department of Education report called *A Nation at Risk* proclaimed,

*“Our Nation is at risk. Our once unchallenged preeminence in commerce, industry, science, and technological innovation is being overtaken by competitors throughout the world. This report is concerned with only one of the many causes and dimensions of the problem, but it is the one that under girds American prosperity, security, and civility. We report to the American people that while we can take justifiable pride in what our schools and colleges have historically accomplished and contributed to the United States and the well-being of its people, the educational foundations of our society are presently being eroded by a rising tide of mediocrity that threatens our very future as a Nation and a people. What was unimaginable a generation ago has begun to occur--others are matching and surpassing our educational attainments.*

*If an unfriendly foreign power had attempted to impose on America the mediocre educational performance that exists today, we might well have viewed it as an act of war. As it stands, we have allowed this to happen to ourselves. We have even squandered the gains in student achievement made in the wake of the Sputnik challenge. Moreover, we have dismantled essential support systems which helped make those gains possible. We have, in effect, been committing an act of unthinking, unilateral educational disarmament.”* (National Commission on Excellence in Education, 1983, p. 5)

Subsequent to this report and further fueled by rising costs in higher education, external measures to ensure quality education were adopted and in some states legislated. These external pressures for accountability came in several forms: changes in accreditation standards, new tougher expectations by grant funding agencies, and the genesis of performance-based funding by state legislative bodies.

## **Accountability**

In 1998, the California Legislature, in partnership with the California Community College Chancellor's office, legislated performance-based funding for the California Community College system called Partnership for Excellence (PFE). Performance-based funding requires output in order to gain input (funding). The output identified by PFE was increased performance on the following statistical data:

- numbers of transfer students
- degrees and certificates
- successful course completions
- completed workforce development training
- improvement in basic skills

*"The Partnership for Excellence program is hereby established for the purpose of achieving annual performance goals and improving student learning and success."*

SEC. 35. Section §84754 Education Code

California was not alone, nor the originator of this funding for performance accountability. By 2000 over 37 states had legislated performance-based funding, clearly communicating the public desire for educational accountability. However, none of these legislated measures have proven successful in improving education. In fact, in some cases the effort to increase statistical measures actually placed a negative pressure on the quality of education. (See the California Academic Senate link at the right for a critique of PFE.) While performance-based funding was new to the general fund budget, assessment and accountability were not new to higher education. Grant funded initiatives and vocational programs have been producing assessment data for years to justify funding and improve effectiveness. (note: This act is scheduled to be changed or sunset in January, 2005).

Unlike the lukewarm effectiveness of performance-based funding, two influential statewide initiatives changed the educational landscape for all components of higher education in California community colleges in 2002. The new ACCJC-WASC Accreditation Standards and the California Master Plan for Education both incorporated expectations for student learning outcomes (SLOs) and assessment plans in every course and program in California community colleges ([ACCJC-WASC, 2002](#); [California Master Plan for Education, 2002](#)). Compared to the relatively ineffectual legislated pressures which largely addressed institutional and administrative level responsibilities, these accreditation requirements drove accountability and assessment to the level of faculty-student interaction and the classroom. This mandated faculty involvement or risked the potential for mandated external assessment as occurred in the K-12 California System. Interestingly, WASC was one of the last accrediting associations to adopt standards that focused on student learning outcomes for accreditation, but the most specific concerning the role faculty must play.

The underlying motivation for these external requirements for accountability was to improve the quality of education. However, mandates will do little to actually create learning-centered improvement in education unless the assessment loop was closed.

## **Why Assessment? Educational Improvement through Accreditation**

*"Accreditation is the primary means by which the quality of higher education institutions and programs is assured in the United States"*

(Council for Higher Education Accreditation, CHEA).

One of the goals of these external measures was to create an environment that continuously addressed quality - a philosophy reminiscent of TQM (total quality management) and CQI (continuous quality improvement). These business terms raised faculty hackles and stimulated

vitriolic debate. Business quality, for instance in manufactured products, is usually maintained by careful control of both the components and the process used to create the product. In business, explicit specifications delimit the component parts used; strict protocols determine processes; and rigorous standardized testing provides the final data concerning the product quality. This rigid standardization is not the type of quality that can improve American higher education; it would destroy the variety and uniqueness highly valued in American individuals. Students are not components acquired using explicit specifications and run through a learning process controlled like manufacturing. The challenge to guarantee both quality and diversity has infused and shaped the type of quality control efforts in education.

Can education improve? Are we satisfied with only anecdotal reports? Should we guarantee that coursework is relevant and adequately current to meet a rapidly changing global environment? As faculty we will often complain about the lack of preparation characterized by incoming students and wonder who will do something about this. Naturally we can not assume that our efforts *alone* are as good as they can get; we can also not expect the public to simply take our word for the quality of education. As educational costs increase and demands for accountability increase, how will we guarantee quality, yet retain the individuality of American Higher Education?

U.S. higher education institutions are characterized by unique and individualized missions and values. The raw ingredients, from the students to the faculty and curriculum vary tremendously. Fostering heterogeneity and individuality, while maintaining quality, has been accomplished through a process of peer review called accreditation.

Specific criteria that represent quality education are enumerated as Accreditation Standards by regional accrediting bodies. Accreditation is a peer review process that guarantees an institution actually does what it professes to the public it will do. The review validates that there is evidence to prove that colleges and universities meet basic standards through existing institutional structures and functions. (For more detailed information check out the links on the right.) Accreditation is a public stamp of approval which influences which students select to attend, what funding sources will invest in which institutions, and the recognition or transferability of an institution's courses, degrees, or certificates.

Accreditation creates a cycle of review and improvement based upon campus-wide dialogue and a culture of evidence produced through assessment processes.

### **ACCJC-WASC Accreditation**



#### **“What is accreditation?”**

“Accreditation is a status granted to an educational institution that has been found to meet or exceed stated criteria of educational quality. Institutions voluntarily seek accreditation and it is conferred by non-governmental bodies.

*Accreditation has two fundamental purposes:*

- to assure the quality of the institution and to assist in the improvement of the institution.

*Accreditation of an institution by an institutional accrediting body certifies to the general public that the institution:*

- has appropriate purposes.

- has the resources needed to accomplish its purposes.
- can demonstrate that it is accomplishing its purposes.
- gives reason to believe it will continue to accomplish its purposes.”

This material is taken directly from the ACCJC-WASC website <http://www.accjc.org>

For more information on accreditation, look at Council for Higher Education Accreditation <http://www.chea.org> and the accrediting region for your area. The Western Association of Schools and Colleges is WASC, which has a special section for Community and Junior Colleges ACCJC-WASC at <http://www.accjc.org>

Most faculty are NOT motivated to do assessment as a result of external requirements such as accountability or even internal peer review through accreditation.

The major reason faculty are motivated to do assessment is the ability to improve student learning, because assessment equips faculty to measure outcomes and adjust the input for those outcomes through calculated improvements. Assessment allows faculty to figure out what works in their classroom and what does not work.



## Why Assessment? Educational Improvement



*“Post secondary assessment done right must be rooted in the course and in the classroom, in the individual cells, to speak metaphorically, where the metabolism of learning actually takes place” (Wright, 1999).*

*“Classroom assessment is the purest form of assessment-for-improvement, because the information gleaned can be immediately used to improve teaching and learning ...the further away from the individual classroom you get, the harder it becomes to turn assessment data into useable information” (Miller, 1997)*

Classroom assessment data has unique features which make it especially useful for producing immediate and palpable improvement in learning. Classroom assessment can:

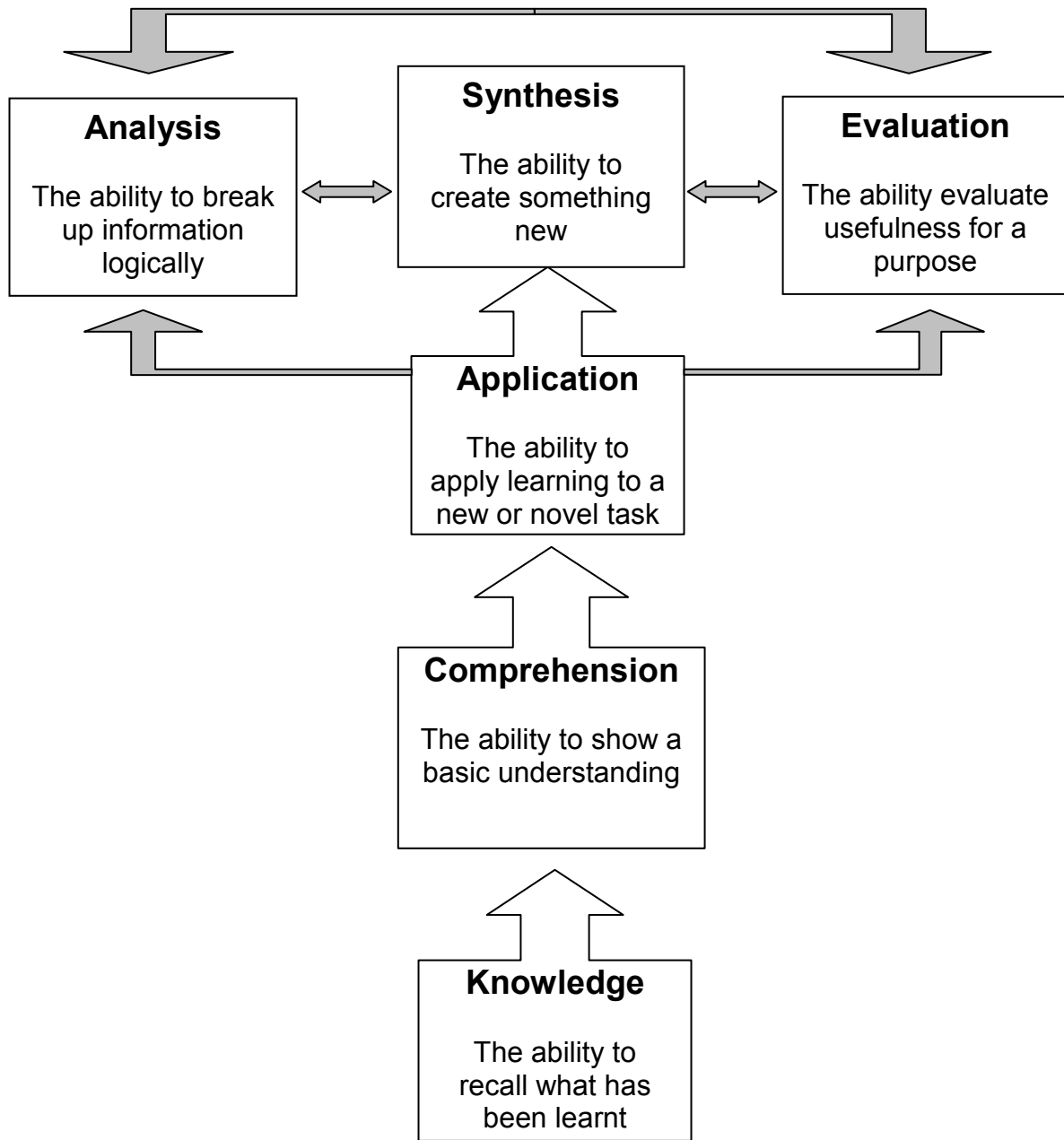
- guide teaching that targets appropriate levels of Bloom's taxonomy and deep versus superficial learning.
- provide immediate feedback, the most powerful method known for improving learning.
- develop a conduit for diagnostic feedback to adjusting pedagogy effectiveness.
- motivate faculty and students and invigorate professional dialogue.
- link educational tracks and goals into a cohesive pathway for students.
- move the institution towards the learning paradigm.

### **Assessment practices specifically target appropriate learning.**

The learning theory paradigm powerfully impacted accreditation standards shifting validation of higher education activities from inputs (finances, library books, curriculum, etc) to output, student learning outcomes. This orientation necessitates a review to determine what type of cognitive, psychomotor, and affective learning needs to be produced in the student. Consideration of assessability of outcomes and expectations influences the design of programs and curriculum. Some faculty have found that the objectives or goals written for courses and programs in the past often focused 1) what they were going to cover not what the student would be able to do, and 2) on knowledge or comprehension, rather than more complex levels of thinking. Indeed, some courses should address primarily knowledge and basic skills levels, however some faculty have found the assessment process useful in helping them incorporate outcomes that address higher order thinking skills more directly. In addition it is expected that general education courses are include a

component of critical thinking requiring analysis, synthesis, and evaluation.

### Interrelationships between Bloom's cognitive levels



Hall, C. & Johnson, A. (1994) Module A5: Planning a Test or Examination. In B. Imrie & C. Hall, Assessment of Student Performance. Wellington, New Zealand: University Teaching Development Centre, Victoria University of Wellington.

## Assessment and Diagnostic Formative Feedback

### Assessment creates diagnostic formative feedback to improve student learning.

The diagnostic information produced through assessment creates a conduit to significantly improve learning through corrective feedback. [Black and Wiliam](#) (1998) conducted an extensive meta-analysis of over 250 articles in order to analyze data documenting the effect of formative assessment. The evidence of their analysis was impressive; formative assessment yielded effect sizes of between 0.4 and 0.7, improving education, more than any other educational intervention.

"An effect size of 0.4 would mean that the average pupil involved in an innovation would record the same achievement as a pupil in the top 35% of those not so involved. An effect size gain of 0.7 in recent international comparative studies in mathematics would have raised the score of a nation in the middle of the pack of 41 countries (e.g. the U.S.) to one of the top five." ([Black and Wiliam](#), p. 141)

[Stiggins](#) (2002) interpreted the effect gains from the Black and Wiliam's research as the equivalent of moving student performance an average gain of 30 percentile points, two letter grades, or 100 points on the SAT scale. This degree of improvement is unprecedented in education by any means of innovative strategies or methods described in the literature. These data indicate the importance of classroom activities linked to assessment and formative feedback. Faculty-driven, classroom-based assessment focused on learning, produces a dynamic feedback loop between faculty and students that energizes the learning environment and produces tangible improvements in education.

*Angelo, T.A. (May, 1999). Doing Assessment As If Learning Matters*  
Most. <http://aahebulletin.com/public/archive/angelomay99.asp>

Black, P. J., & Wiliam, D. (1998). Inside the black box; Raising standards through classroom assessment. *Phi Delta Kappan*, 80 (2), 139-144.

Chappuis, S., & Stiggins, R.J. (2002). Classroom assessment for learning. *Educational Leadership*, 60(1), 40-43

Wright, B. D. (1999). *Evaluating learning in individual courses*. California Assessment Institute Website. <http://www.ca-assessment-inst.org/Resources/Wright2.doc>

## Assessment and the Learning Paradigm

**Assessment represents a vehicle for shifting an institutional culture to the learning paradigm.**



This is described by Barr and Tagg (1995) in the following excerpt *From Teaching to Learning: A New Paradigm for Undergraduate Education*.

"Subtly but profoundly we are shifting to a new paradigm: A college is an institution that exists *to produce learning*. This shift changes everything. It is both needed and wanted. We call the traditional, dominant paradigm the Instruction Paradigm. Under this paradigm colleges have created complex structures to provide for the activity of teaching conceived primarily as delivering 50-minute lectures-the mission of a college is to deliver instruction. Now, however, we are beginning to recognize that our dominant paradigm mistakes a means for an end. It takes the means or method-called "instruction" or "teaching"-and makes it the college's end or purpose. To say that the purpose of colleges is to provide instruction is like saying that General Motors' business is to operate assembly lines or that the purpose of medical care is to fill hospital beds. We now see that our mission is not instruction but rather that of producing *learning* with every student by *whatever* means work best. The shift to a "Learning Paradigm" liberates institutions from a set of difficult constraints." (1995, p.13)

Simply incorporating new programs and activities into traditional institutions falls far short of the new paradigm. O'Banion (1997b) defined six key principles upon which a learning college is based these included:

- institutional commitment to substantive change in the learners,
- learner accountability as full partners
- institutional dedication to diverse learning options
- student participation in collaborative learning
- re-defining of faculty roles and staff roles according to learning needs
- evidence of success documented by learning outcomes.

Assessment provides both the data to validate and the feedback to transform into a learning-centered institution.

## Assessment Prompts Learning

In an alternative perspective to that dreaded question, “Will this be on the test?” [Boud \(1995a\)](#) suggested that assessment *prompts* learning. In other words, faculty provoke deep learning with appropriate types of challenging assessment methods, or conversely, develop rote memory and recall via assessment methods. Student learning is guided not only by what we test, but also by how we test. If we ask for simple recall, students will study and regurgitate; if we ask for synthetic, evaluative and analytical questions, their studying must address this.

### **Assessment can help faculty address learning using new cognitive research information.**

New technology and recent research concerning how people learn has provided important information about the brain that can enhance classroom pedagogy and improve learning. The following information is excerpted from *Knowing What Students Know* by the National Research Council.

- Students come to class with pre-conceptions that must be engaged or they will fail to grasp new concepts and information, or they will learn new information for a test only to revert to preconceptions outside of class.
- Students develop competence in an area when they have: (a) a deep factual knowledge, (b) understand the facts within a conceptual framework, and (c) organize knowledge so that they can retrieve and apply it.
- Students that take control of their own learning, through a metacognitive approach (monitoring their own goals and progress in achieving them) are able to achieve deep and permanent learning.
- Assessment represents an essential component for improving teaching and learning but it must target proficiency of content and metacognitive skills.
- An important role for assessment is timely, informative feedback to facilitate practice and acquisition of proficiency of skills and deep learning. Assessment should reveal the development of knowledge and skills to allow formative improvement, not just summative judgment, if it is to improve teaching and learning.
- Technology represents a unique opportunity to engage knowledge 12

## Other Definitions of Assessment

ACCJC-WASC defines assessment as the methods that an institution employs to gather evidence and evaluate quality. [ACCJC-WASC Commission Standards, 2002, p. 29](#)

Assessment is an ongoing process aimed at understanding and improving student learning. It involves making our expectations explicit and public; setting appropriate criteria and high standards for learning quality; systematically gathering, analyzing, and interpreting evidence to determine how well performance matches those expectations and standards; and using the resulting information to document, explain, and improve performance. When it is embedded effectively within larger institutional systems, assessment can help us focus our collective attention, examine our assumptions, and create a shared academic culture dedicated to assuring and improving the quality of higher education. [\(Angelo, 1995b, p.7\)](#).

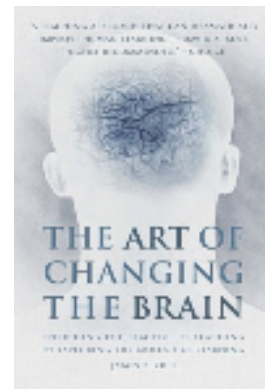
I shall consider *assessment* to include the gathering of information concerning the functioning of students, staff, and institutions of higher education. The information may or may not be in numerical form, but the basic motive for gathering it is to improve the functioning of the institution and its people. I use *functioning* to refer to the broad social purposes of a college or university: to facilitate student learning and development, to advance the frontiers of knowledge, and to contribute to the community, and the society. [\(Astin, 1993, p.2\)](#)

Educational assessment includes all of the data-gathering and evaluative processes that allow us to understand teaching and learning. [\(Tanner, 2001, p. 17\)](#)

## Deep Learning

New research in neurobiology has contributed to greater understanding of how people store and use knowledge. This evidence actually builds on Bloom's Taxonomy which categorizes types of knowledge and the way it is used ranging from simple recall to more complex synthetic or analytic processes.

Faculty are familiar with superficial and deep learning. Superficial learning involves rote memory and recall. . Students often limit the extent of their studying to techniques that involve flashcards, lists, or definitions of course content and sometimes remain unskilled in relating that material to important concepts from other disciplines or using that material to make judgments in everyday life. Deep learning is characterized by useful knowledge, knowledge that can be used to construct and synthesize new understanding. [Zull \(2003\)](#), an educator and neurobiologist, describes in his book, *The Art of Changing the Brain: Enriching the Practice of Teaching by Exploring the Biology of the Brain*, the biological aspects of the brain relate to learning. Long term learning requires the development of new neuronal connections and changes in synapses. The realization that deep learning entails physical and biologic processes should influence way we teach. Zull describes factors involved in driving material beyond the superficial recall level, through deeper parts of the brain, in order to improve learning. The book cover at the bottom of the page is connected to a detailed review of the material in the book and the publishers website if you wish to purchase the book. I would HIGHLY recommend it.



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In addition to Zull's book, the [National Research Council](#) has produced several books which describe the biology and pedagogy involved in "knowing". These books explore the details involved in transforming from a novice, concerning particular information, to an expert. Research data and practical suggestions about pedagogy and assessment make these texts very valuable as you begin to develop and understanding of assessment. These texts can be read online for free or purchased by clicking on the link attached to the book cover below. I have quoted information excerpted from the NRC websites describing how these books provide knowledge and assessment tools related to deep learning.

*How People Learn: Brain, Mind, Experience, and School: Expanded Edition (2000)* "this book offers exciting new research about the mind and the brain that provides answers to a number of compelling questions. When do infants begin to learn? How do experts learn and how is this different from non-experts? What can teachers and schools do-with curricula, classroom settings, and teaching methods--to help children learn most effectively? New evidence from many branches of science has significantly added to our understanding of what it means to know, from the neural processes that occur during learning to the influence of culture on what people see and absorb. **How People Learn** examines these findings and their implications for what we teach, how we teach it, and how we assess what our children learn. The book uses exemplary teaching to illustrate how approaches based on what we now know result in in-depth learning. This new knowledge calls into question concepts and practices firmly entrenched in our current education system." Quoted from the National Academy Press website at <http://books.nap.edu/catalog/9853.html>

Knowing what Students Know: The Science and Design of Educational Assessment (2001) *This book is a "cutting-edge work on the following topics: (1) assessment practices that are based on cognitive principles and are being successfully implemented in schools and classrooms, (2) new statistical models with promise for use in assessing a broad range of cognitive performances, (3) programs that engage students in self- and peer assessment, (4) innovative technologies for learning and assessment, (5) cognitively based instructional intervention programs, and (6) policy perspectives on new forms of assessment."* Quoted from the National Academy Press website at <http://books.nap.edu/catalog/9853.html>