SLO Assessment: Training the Trainers

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General Information on Student Learning Outcomes

In the new Accreditation Standards, a Student Learning Outcome (SLO) describes the:

- knowledge
- skills
- abilities
- attitudes
- beliefs
- opinions
- values

that students have attained by the end of any set of college experiences – classes, occupational programs, degrees and certificates and even encounters with Student Services or the Library. The stress is on what students can **DO** with what they have learned, resulting in some sort of product that can be evaluated.

Faculty must articulate student learning outcomes for each **course**, each **occupational program** and each **degree** and **certificate** that the school offers. Then, they must design assessments or evaluations that provide students with an opportunity to demonstrate what they have learned. Evaluating those assessments gives information to both the student and to the faculty member about how successful the learning experience has been.

In the classroom, the new Accreditation Standards require that SLO's become an integral part of every syllabus. SLO's should also act as a guide for classroom activities and direct classroom assessments or evaluations.

Theory

This approach to teaching believes that "covering" material during a course does not necessarily **guarantee** that students learn it. The instructor has delivered the course, but how do we know if the students have truly absorbed the material, or better yet, can apply it? The new Accreditation Standards state that success and retention are no longer considered an accurate way of answering that question. Success is determined by students emerging from courses with integrated, higher learning skills that they can **demonstrate** to others. Those demonstrations are the proof that they have truly learned.

Another keystone of the theory is the belief that students perform better when they know exactly what is expected of them, including what they will be

required to do and how it will be evaluated. What defines an A, B or C paper or project should be public knowledge. This concept of **transparency** is key to using SLO's successfully in the classroom.

The final key concept is **practice.** Before being evaluated on an SLO, students should have the opportunity to practice the skill or tasks that compose it.

SLOs versus Course Objectives

Student Learning Outcomes for the classroom describe the knowledge, skills, abilities or attitudes that a student can **demonstrate** by the end of your course.

- Don't think about content or coverage - consider what students should be able to DO with what they've learned by the end of the semester.
- How will students demonstrate this?
- What can they produce to show faculty that they have learned to apply their new knowledge?

When trying to define Student Learning Outcomes for a course, think of the big picture. SLOs:

- Describe the broadest goals for the class, ones that require **higher-level** thinking abilities.
- Require students to **synthesize** many discreet skills or areas of content.
- Ask them to then **produce** something - papers, projects, portfolios, demonstrations, performances, art works, exams etc. – that **applies** what they have learned.
- Require faculty to **evaluate** or **assess** the product to measure a student's achievement or mastery of the outcomes.

Course objectives are on smaller scale, describing small, discreet skills or "nuts and bolts" that require basic thinking skills. They are subsets of outcomes. Think of objectives as the building blocks used to produce whatever is used to demonstrate mastery of an outcome. Objectives can be practiced and assessed individually, but are usually only a portion of an overall project or application. See the next page for a table contrasting outcomes and objectives.

	Objectives	Outcomes
Scope	Skills, tools, or content to engage and explain a particular subject	Overarching results - subsequent learning
Target	Details of content coverage and activities which make up a course curriculum.	Higher level thinking skills that integrate the content and activities.
Major Influence	Input – nuts and bolts	Output – Observable evidence (behavior, skill, or discrete useable knowledge) of learning.
Number	Objectives can be numerous, specific, and detailed to direct the daily activities and material.	SLOs are limited in number (5-9) to facilitate modification and improvement of teaching and learning.

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The Learning Paradigm and Learning Institutions

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. (Barr & Tagg, p 13)

Barr, R. B., & Tagg, J. (1995). From teaching to learning: A new paradigm for undergraduate education. *Change*, *27*(6), 12-25.

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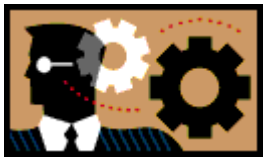
Are you still confused? Look at the following three pages for examples of the difference between outcomes and objectives describing the knowledge, skills and abilities, and attitudes in a course. Note that there is a **flow**, a line of progression from the most basic objectives to the most sophisticated outcomes. The charts are adapted from the work of Janet Fulks and Kate Pluta from Bakersfield College. To help you write a course outline, they have noted the words from Bloom's Taxomony that can be used to describe either an objective or outcome.

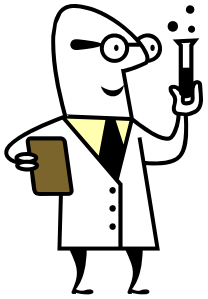


Knowledge

Objectives
Basic
Knowledge

Outcomes
More Sophisticated
Higher Level Thinking

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



Skills and Abilities

Objectives
Basic Knowledge
Basic Skills
Level

Outcomes
More Sophisticated Skills
Higher Level Abilities
Critical Understanding of Performance

Observe	Model	Recognize Standards	Correct	Apply	Coach
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

Attitudes

Objectives

Elementary Values and Behaviors
Inherited Value System
Egocentric View

Outcomes

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

Receiving	Responding	Valuing	Organizing	Characterizing
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

Sample Student Learning Outcomes

Here are sample outcomes developed by Cabrillo faculty for course outlines. Note the verbs used and how they reflect higher level thinking skills, thus making them SLOs rather than objectives.

CEM 151 Construction Fundamentals: Principles and Practices

1. **Construct** a building applying the skills and knowledge obtained in this class.

ANTHRO 13 Forensic Anthropology

1. Using the basic principles of forensic anthropology, **analyze** skeletonized human remains to determine sex, age at death, height and genetic ancestry.

ATH 15HH Preseason Intercollegiate Water Polo - Men

1. **Analyze and customize** principles of cardiovascular fitness, muscular strength, endurance, and flexibility to water polo, and **apply** them to prevent injury.

DANCE 58 Street Dance and Hip Hop

1. **Perform,** with an increasing degree of proficiency, simple Hip Hop movements, **demonstrating** increasing control of skills pertaining to memorization, physical safety, body awareness, alignment, and aesthetic valuing.

CIS 103 Technical Support and Trouble Shooting

1. **Analyze** symptoms of host configuration errors.
1. **Solve** novel hardware and software problems.
2. **Create** technical documentation for user training.

CABT 131 Microsoft Word

1. **Analyze** communication requirements and **produce** professional-quality business documents, including letters, memoranda, and multi-page reports, using intermediate and advanced features of Microsoft Word.

JOUR 53 – Newspaper Production and Copy Editing

Construct visually attractive and readable newspaper pages by:

1. Using knowledge of effective design to fit graphical and text elements on newspaper pages and resolve problems with space constraints

2. Critiquing newspaper pages for design principles and design quality

Theatre Art (a series of courses)

TA 7 – Intro to Acting

Select, analyze, and perform selections from dramatic texts **utilizing** the performance skills of memorization, vocal projection, spatial awareness, stage directions and physical expression.

10A – Beginning Acting

Select, analyze, and perform selections from dramatic texts **demonstrating increasing contro**l over the skills of memorization, vocal projection, spatial awareness, stage directions and physical expression.

10B – Intermediate Acting

Select, analyze, and perform selections from dramatic texts **demonstrating consistent control** and use of the performance consistent skills of memorization, vocal projection, spatial awareness, stage directions and physical expression.

10C – Advanced Acting

Select, analyze, and perform selections from dramatic texts **demonstrating a mastery** of the performance skills of memorization, vocal projection, spatial awareness, stage directions and physical expression.

English Composition series

255 – Basic Writing

1. **Write** paragraphs and short essays **demonstrating** basic sentence-level competency and culminating in a portfolio.
2. **Comment** on ideas and writing strategies in reading assignments.

100- Elements of Writing

1. **Write essays demonstrating** sustained clarity of intention, awareness of audience, and various writing techniques.
2. **Articulate** responses to readings in various genres.

1A – College Composition

1. **Write essay**s, including research-based writing, **demonstrating** academic rhetorical strategies and documentation.
2. **Analyze** and evaluate assigned and researched texts.

1B – Composition and Literature

1. **Write literary analysis**, interpretation, and research-based essays.
2. **Demonstrate** close readings of literary texts for analysis and interpretation.

2 – Critical Thinking

1. **Write evidence-based essays demonstrating** logical reasoning and argumentative skills.
2. **Evaluate** logical reasoning and argument in assigned and researched texts.

Some Dos and Don'ts:

1. Don't use the words "understand" - go for higher level thinking skills.
2. Don't use the phrase "students will." Avoid any pronouns like "them" or "their."
3. Do distinguish the difference between an A and B courses of the same number.
4. Keep the number of outcomes short – no more than four or five at most (except if the outcomes of your courses are dictated by the requirements of outside accrediting bodies, like in nursing or dental hygiene). Use the outcomes to describe the **major** skills or knowledge students will take away from the course and what they will **produce** to show you that they have mastered those skills.

Guide to Writing SLOs

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. Use the Worksheet below 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. See the previous pages for examples.

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 assignment.

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?

Writing Student Learning Outcomes Worksheet

Course Name and Number _____

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

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Rubric Writing Overview

A **rubric** translates the standards and criteria that make up grading into some sort of chart or description. Rubrics can be used to score many kinds of written assignments or exams, papers, projects, speeches or portfolios. They are not useful, however, as a grading mechanism for multiple choice or short answer tests. However, you can analyze those kinds of assessments by looking at groups of questions to also determine how well students are mastering your outcomes.

A rubric answers the question, "What precisely is an A on a particular assignment or project? How is it different from a B or C?" While this is information that many of us carry inside our heads, in order to clearly assess student learning outcomes, it must be articulated in writing. However, it is up to you – the expert in your classroom – to define these standards and criteria and how they will be applied to the class work that you assign. Your rubric will be as individual as your grading style and pedagogy.

Sample Rubric for Oceanography 10 Lab Project

Bathymetric Map and Cross Section (Lab #2) Grading Criteria

An "A" grade (9 or 10 out of 10):

- The contour lines are extremely smooth and evenly spaced with none of them touching each other.
- Every water depth # has the appropriate contour line next to it and the entire map is "contoured".
- The overall presentation is excellent.
- The cross section is accurate and complete and the bottoms of the canyons and top of the ridge are not flat.
- The ends of the cross section are complete and the paper shows the vertical exaggeration.

A "B" grade (8 out of 10):

- The contour lines are neat and smooth and appropriately spaced and some are touching, but very few.
- Nearly all the water depth #'s are contoured, some may be missing, but very few.
- The overall presentation is good and very few "shadows" are showing.
- The cross section is accurate, but some information is missing, particularly on the ends.
- Vertical exaggeration may or may not be shown.

A "C" grade (6 or 7 out of 10):

- The contour lines are a little wide and show fringes, some may have double ends and some of them are obviously touching each other.
- Some of the water depth #'s may not be contoured and the contour lines are all not evenly or properly spaced. There may be shadows on the map and the overall presentation is slightly sloppy.
- The cross section is mostly accurate, but some information is off line and missing, particularly on the ends.
- Vertical exaggeration may not be shown.

A "D" and "F" grade (5 or less out of 10):

- The contour lines are sloppy and inaccurate and some or many are touching each other.
- Several of the water depth #'s are not accurately contoured and the map is not complete.
- The overall presentation is below or far below average.
- The cross section is inaccurate, and much information is off line and missing.
- Vertical exaggeration may be shown.

Developed by Dave Schwartz, Geology.

Creating Rubrics Worksheet 1

Course Name and Number	
Core Competency or Course SLO	
Assessment Tool/Assignment	
Assignment Components	
1.	2.
3.	4.
5.	6.
7.	8.

Creating Rubrics Worksheet 2

Articulate your standards for each component

Score: A	Write a sentence that describes the component at this level. Be as specific as possible.
Component 1:	
Component 2:	
Component 3:	
Component 4:	
Component 5:	
Component 6:	
Component 7:	
Component 8:	

Creating Rubrics Worksheet 2

Articulate your standards for each component

Score: **B**	Write a sentence that describes the component at this level. Be as specific as possible.
Component 1:	
Component 2:	
Component 3:	
Component 4:	
Component 5:	
Component 6:	
Component 7:	
Component 8:	

Creating Rubrics Worksheet 2

Articulate your standards for each component

Score: C	Write a sentence that describes the component at this level. Be as specific as possible.
Component 1:	
Component 2:	
Component 3:	
Component 4:	
Component 5:	
Component 6:	
Component 7:	
Component 8:	

Creating Rubrics Worksheet 2

Articulate your standards for each component

Score: D	Write a sentence that describes the component at this level. Be as specific as possible.
Component 1:	
Component 2:	
Component 3:	
Component 4:	
Component 5:	
Component 6:	
Component 7:	
Component 8:	

Creating Rubrics Worksheet 2

Articulate your standards for each component

Score: **F**	Write a sentence that describes the component at this level. Be as specific as possible.
Component 1:	
Component 2:	
Component 3:	
Component 4:	
Component 5:	
Component 6:	
Component 7:	
Component 8:	

Analyzing Test Questions

If you assess student learning in your courses through multiple choice exams, it's possible to analyze the questions in your tests to assess how well students are mastering any of the core competencies. The first two steps help you to analyze your questions. Step Four describes how to use campus scoring machines to help you complete your analysis. This particular method was developed by Cabrillo's Paul Harvell, in Economics. You may find another approach works better for you.

Step One: Identify the questions on the test which you feel address the Core competency that you are assessing. There should be several questions throughout an exam that you feel require students to demonstrate mastery of the specific competency.

Step Two: Deepen your analysis of the questions by further categorizing them. A way to do this is offered in *Effective Grading*, by Walvoord and Anderson, page 87, created by Patricia Schlecht of Raymond Walters College in Ohio.

Level A: Those that require higher critical thinking, including analysis, synthesis or evaluation. For these questions, there may be no directly visible connection between the course material and the test question.

Level B: Those that require lower critical thinking skills, such as application. These questions can be directly answered from the background provided by course materials. There is a visible connection between the material and the test questions.

Level C: Those that utilize knowledge and comprehension, but not critical thinking. The answers to these questions arise directly from the course material, with some changes in wording and phrasing.

Step Three: Grade the entire exam as you do usually. If you use Scantron or any other campus scoring machines, program it with the key to your entire exam.

Step Four: Create a second key that only scores the answers to the questions that you have identified as addressing the core competency. Ask the machine to give you a summary that reports how many students missed each question.

Step Five: Analyze the results, looking at how many students missed what level of question. Are you pleased or satisfied with how they did? Is there anything you could do differently to try to ensure that more students answer the questions correctly? In other words, how well do you think students are demonstrating mastery of the competency in your exam? Use the forms on pages 29 and 30 to record your thoughts.

Step Six: Report your assessment results and analysis in your department during Flex.