Handout: Writing Behavioral Learning Outcomes

Source: *Adapted and modified from guidelines provided by the American College of Occupational and Environmental Medicine, online at http://www.acoem.org/education/jointsponsor/ Learning%20Objectives.pdf [retrieved 10/11/05];and the University of Cape Town (South Africa), Manual on Designing and Managing Multiple Choice Questions (Appendix C), 1996, by John Carneson Georges Delpierre, and Ken Masters, online at http://web.uct.ac.za/projects/cbe/mcqman/mcqappc.html [retrieved 10/11/05] .*

Formulating behavioral learning outcomes

Behavioral learning outcomes should:

- focus on the learner (the student); and
- specify what the learner should be able *to do* at the end of a learning activity or at the end of the course.

How should behavioral learning outcomes be written?

Start with the phrase: "At the conclusion of this course (or activity), participants should be able to:" and then state the things participants will be able to do. Be sure to use specific action verbs (behavioral terms) in these statements – verbs such as "identify," "cite," "describe," or "assess." A list of suggested verbs is provided on the following pages. If you follow this simple format and keep the list of verbs by your side, it is almost impossible to write a bad set of behavioral learning outcomes!

Common mistakes

Verbs such as "know" and "understand" are vague. Avoid these words and use action verbs from the list provided. "Understanding" can have a myriad of meanings and it can be difficult to evaluate whether a learner "understands" a concept. However, a learning outcome that states that a medical student, for example, "will be able to cite the risk factors for breast cancer" can be evaluated consistently as to whether it has been achieved.

Often course proposals list teaching objectives rather than learning outcomes. Examples: "To acquaint the student with the key clinical features necessary for the diagnosis of common rheumatic diseases." "To update, reinforce, and provide new information regarding the etiology, pathogenesis, diagnosis, treatment, and prognosis of herniated thoracic disc." These objectives focus on what the instructor plans to do, rather than what the learner outcome will be.

Proposals sometimes give objectives which are just a list of topics. Examples: "1. Principles of laser mechanics; 2. Laser uses in the cardiovascular system; 3. Efficacy of lasers in cardiovascular disease." This focuses on what the instructor will do rather on what the learner will achieve.

Remember: When writing learning objectives, focus on the learner!

List of suggested verbs for formulating behavioral learning outcomes

The following verbs parallel Bloom's (1956) taxonomy outlining levels of cognitive learning. The taxonomy represents a hierarchy from the lowest-level cognitive skills (knowledge-related) to those at the highest level (evaluation-related).

Knowledge: remembering previously learned material				
Cite	Identify	Quote	Relate	Tell
Count	Indicate	Read	Repeat	Trace
Define	List	Recite	Select	Write
Describe	Name	Recognize	State	
Draw	Point	Record	Tabulate	

Comprehension: ability to grasp the meaning of material				
Associate	Describe	Explain	Locate	Translate
Classify	Differentiate	Express	Predict	
Compare	Discuss	Extrapolate	Report	
Compute	Distinguish	Interpolate	Restate	
Contrast	Estimate	Interpret	Review	

Application: ability to use information in new and concrete situations				
Apply	Employ	Locate	Relate	Sketch
Calculate	Examine	Operate	Report	Solve
Complete	Illustrate	Order	Restate	Translate
Demonstrate	Interpolate	Practice	Review	Use
Dramatize	Interpret	Predict	Schedule	Utilize

Analysis: ability to break down material into component parts to understand its structure			
Analyze	Debate	Distinguish	Inventory
Appraise	Detect	Experiment	Question
Contract	Diagram	Infer	Separate
Criticize	Differentiate	Inspect	Summarize

Synthesis: ability to put parts together to form a new or original whole				
Arrange	Construct	Formulate	Organize	Produce
Assemble	Create	Generalize	Plan	Propose
Collect	Design	Integrate	Prepare	Specify
Compose	Detect	Manage	Prescribe	

Evaluation: ability to judge the value of material based upon definite criteria				
Appraise	Determine	Judge	Recommend	Test
Assess	Estimate	Measure	Revise	
Choose	Evaluate	Rank	Score	
Critique	Grade	Rate	Select	

Bloom, Benjamin S., & Krathwohl, David R. *Taxonomy of Educational Objectives: The Classification of Educational Goals, by a committee of college and university examiners. Handbook I: Cognitive Domain*. New York, Longmans, Green, 1956.

Handout: Assessing Student Achievement of Learning Outcomes

Once desired learning outcomes have been specified in behavioral terms, methods should be outlined that will allow assessment of student achievement for each outcome. Such assessments provide important data for program review, curriculum improvement, and monitoring of student performance. Plus, in the case of courses that fulfill General Education requirements, SUNY System Administration mandates assessment of SUNY-specified General Education learning outcomes according to set criteria. (For more information on special assessment requirements for General Education courses, contact the Carol Tutzauer, Director for Assessment, tutzauer@buffalo.edu.)

While assessment could involve supplemental efforts by students, most instructors will find it most expedient to utilize existing course activities as the basis for assessment. Once a course-embedded activity is identified and a framework for its scoring (grading) specified, a decision rule can be established for classifying students as to their achievement level for the given learning outcome.

The list below is provided as an aid to faculty in identifying existing activities that could be used for assessment purposes.

Multiple-choice exam. Many faculty, particularly those with large class enrollments, utilize multiple-choice exams to evaluate student learning. Although items may cover a variety of learning objectives for the course, a subset of items can frequently be identified to gauge student achievement of one or more specific learning outcomes. Computerized scoring makes the process simple given the scan-center options either of designating a "subtest" or an alternative scoring key. Both options allow direct reporting of results on the subset of items alone, perfect for providing a measure for each distinct learning outcome.

Pre- and post-testing. A very simple method for determining the amount of learning in a course is to test at the beginning of the course and then test again at the conclusion of the course. Many faculty have found this process extremely beneficial for a variety of purposes: (1) identifying initial misunderstandings or lack of prerequisite knowledge; (2) motivating students to attend to course content; (3) signposting to students what they will be expected to *do* by the *end* of the course; and (4) providing key evidence of learning *gains.* Although the idea of pre- and post-testing may at first seem onerous, it can be as simple as administering an old exam on the first day of class!

Semester-end project. Frequently, students will be expected to demonstrate their acquired skills through completion of a course project. Such projects are generally scored according to set criteria, whereby the student demonstrates his/her facility with a number of course-related skills. The scores on some or all of the criteria can serve as the assessment data for certain learning outcomes.

Lab reports. An important vehicle for learning scientific methods of inquiry is the laboratory experiment. When faculty require that the student produce a report detailing various aspects of his/her laboratory experience, then the laboratory report can frequently form the basis for assessing student learning on one or more outcomes. This is especially true when faculty scoring involves a checklist of components that must be present in the report. Lab reports provide a rich data source for evaluating student skill and understanding, particularly in the natural sciences.

Final paper. In classes with smaller enrollments, faculty frequently require students to write a final paper that effectively synthesizes what they have learned and gives students the opportunity to demonstrate their depth of understanding. Provided that the faculty member formally scores the paper on various dimensions or against particular criteria, the student paper becomes an excellent source of data for assessment.

Other student products: Anything that a student produces for the course and that is evaluated by the instructor can potentially be used for assessment. Below are other student products that can provide data on student learning:

- Presentation or speech
- Formal essay
- Group project
- Group discussion
- Case study
- Game
- Portfolio of student work
- Journal or log
- Performance
- Problem sets or other homework
- Critique
- Quiz

Sample assessment plan

Course: COM515 Communication Theory

Description: In this course, students will survey theoretical approaches employed in the study of communication processes. Students will also learn the essential features of several theoretical approaches: covering law, rules, systems, critical, and postmodern. After surveying existing theories, students will examine how theories are constructed, explicated, and then tested. This course is designed to prepare entering graduate communication students to become active participants in the communication field.

Learning outcomes and method of assessment:

By the end of the course, students should be able to …	**Method of assessment …**
Identify major theories in the areas of interpersonal, organizational, group, and mass communication	Competency-based exam in which students must read research abstracts and identify the communication theory being tested (70% correctly identified = outcome achieved)
Classify theories as to their ontological approach: covering law, rules, systems, critical, or postmodern perspective	Competency-based exam (above), but after identifying the theory, the student must also indicate the ontological approach of that theory (70% correctly identified = outcome achieved)
Construct an original theory in an area of personal interest	Student theory construction paper, in which student must present a theoretical problem, literature review, and then outline an original theory that they contend helps explain the problematic situation (student will revise and resubmit paper until it meets "conference paper" quality standard)
Propose a research study to test key hypotheses derived from their original theory	Student theory construction paper, in which student must also write a research proposal to test several hypotheses that can be derived from their original theory (student will revise and resubmit paper until it meets "conference paper" quality standard)
Critique research studies as to their ability to test underlying theory	Student critiques of fellow students' oral presentations of their theories and accompanying research proposals (must identify at least one key limitation for each presentation critiqued in order for outcome to be achieved)