

Establishing Learning Outcomes

A basic step in any assessment process is establishing a list of learning outcomes for students in the program. Once faculty members articulate the mission of the program, they need to focus on specific learning outcomes for students in the major. How are learning outcomes different from program goals? The distinction is not always sharply defined, but generally the focus of learning outcomes is on what students will learn rather than on what will be taught. Thus, goals tend to focus on delivery (i.e. teaching), outcomes on effect (i.e. learning).

It might be helpful to consider the following questions as a guide for discussion:

- 1) What do we want students in our major to know?
- 2) What do we want our students to be able to do?
- 3) What values or attitudes (dispositions) do we want to instill in our students?

Multiple perspectives on learning are useful. In addition to faculty, students in the major, colleagues from the discipline, alumni, or professionals/practitioners in the field might also be involved in the discussion about learning outcomes. Most importantly, learning outcomes should not be developed only by the faculty member “responsible for” assessment. Instead, conversations about the program’s learning outcomes should engage, as broadly as possible, other people invested in the success of the program’s students.

Starting the Conversation

A common way to start the conversation about learning outcomes is to begin with a review of the mission statement for the program and, if applicable, accreditation standards. Faculty might also review examples of learning outcomes published through their professional organizations or by departments with similar programs at other schools. This process should help generate a comprehensive list of ideas and suggestions for learning outcomes that can then be refined and narrowed.

Focusing Outcomes

Program learning outcomes should number fewer than a dozen and ideally five to ten. Because assessment determines student achievement in each outcome, having too many outcomes almost assures that the assessment effort will be cumbersome and lack focus. Learning outcomes should not consist of the sum total of all outcomes identified by all faculty members in the department; on the contrary, it should contain only the *minimum* list of outcomes that faculty members consider to be essential for a graduate of their program.

Selecting the Student Learning Outcomes

Steps

1. Examine the program/department/college/university mission
2. Determine what graduates of that program should know, what skills they should be able to demonstrate and what professional values should they hold
3. Convert the list of expected outcomes for graduates into a list of general objectives
4. Convert the general objectives into statements of specific learning outcomes (may have more than one for each objective)

Hints

- Describe student performance, not teacher/professor performance
- Describe learning product, not process
- Be specific without simply stating the subject matter to be learned
- Stick to one type of result for each objective (e.g., do not say “Knows the scientific method and applies it effectively”)
- Each learning outcome should start with an action verb that indicates observable and measurable behavior
- Group similar outcomes into one (e.g., “Describes functions of the heart” and “Describes functions of the liver” to “Describes functions of major body organs”)

Questions to ask in selecting outcomes

- Is it measurable?
- Is it meaningful?
- Who is the target audience of my outcome?
- Are the objectives written at the appropriate level for this audience (beginning vs. graduating students)
- How will I know if the outcome has been met?
- Will it provide me with evidence that will lead me to make a decision for continuous improvement?

Before Writing Your Learning Outcomes

Before beginning to write the learning outcomes in the appropriate format, it is important to understand the learning domains and the taxonomy of the levels of learning represented in these domains.

Domains of Learning

The domains of student learning include Knowledge, Skills and Perceptions (values). These three domains represent the areas of knowledge, skill, and attitudes that are the basis for writing learning outcomes. All learning outcomes represent learning or skill and attitude development in these areas.

| (Cognitive) Knowledge | (Psychomotor) Skills | (Affective) Perceptions or Values |
|--|---|---|
| <p>Knowledge is direct information about the world that students assimilate.</p> <p>Knowledge is cognitive. It involves student critical thinking.</p> <p>Knowledge can influence student ideas and world views.</p> | <p>Skills are the demonstrated capacities of students to engage in interactions with the world.</p> <p>Skills are behavioral. They involve student doing.</p> <p>Skills can help the student be a better communicator, analyst, professional and citizen.</p> | <p>Values are constructs that students think are most important.</p> <p>Values are tied to affective states. They involve student feelings.</p> <p>Values help students prioritize what actions they will take in their personal and professional lives.</p> |
| <p>Examples of knowledge outcomes:</p> <p>The student can describe the main ideas of a theory.</p> <p>The student can identify and describe ethical dilemmas.</p> | <p>Examples of skills outcomes:</p> <p>The student can present information to others.</p> <p>The student can write a term paper that has a clear ethical theme.</p> | <p>Examples of values outcomes:</p> <p>The student engages in social action activities to promote social justice.</p> <p>Within an ethical dilemma, the student selects a course of action based on prioritizing what the student says is most important.</p> |

Bloom's Taxonomy of Levels of Learning

Benjamin Bloom created the following taxonomy for categorizing levels of learning or skill and attitude development that normally occur in educational settings. The table provides an explanation of each level. It also provides guidelines on the types of action verbs that are appropriate for each level of learning. **When writing learning outcomes for entry level students, Knowledge and Comprehension are the most frequently used levels of learning. When evaluating more advanced students (graduating seniors), learning outcomes should be written at the Application, Analysis, Synthesis, and Evaluation levels of learning.**

| Level of Learning | Associated Skills and Action Verbs |
|----------------------|--|
| Knowledge | <ul style="list-style-type: none">• observation and recall of information• knowledge of dates, events, places• knowledge of major ideas• mastery of subject matter• <i>Action Verbs:</i> list, define, tell, describe, identify, show, label, collect, examine, tabulate, quote, name, who, when, where, etc. |
| Comprehension | <ul style="list-style-type: none">• understanding information• grasp meaning• translate knowledge into new context• interpret facts, compare, contrast• order, group, infer causes• predict consequences• <i>Action Verbs:</i> summarize, describe, interpret, contrast, predict, associate, distinguish, estimate, differentiate, discuss, extend |
| Application | <ul style="list-style-type: none">• use information• use methods, concepts, theories in new situations• solve problems using required skills or knowledge• <i>Action Verbs:</i> apply, demonstrate, calculate, complete, illustrate, show, solve, examine, modify, classify, discover |

| | |
|-------------------|---|
| Analysis | <ul style="list-style-type: none"> • seeing patterns • organization of parts • recognition of hidden meanings • identification of components • <i>Action Verbs:</i> analyze, separate, order, explain, connect, classify, arrange, divide, compare, select, explain, infer |
| Synthesis | <ul style="list-style-type: none"> • use old ideas to create new ones • generalize from given facts • relate knowledge from several areas • predict, draw conclusions • <i>Action Verbs:</i> combine, integrate, modify, rearrange, substitute, plan, create, design, invent, what if?, compose, formulate, prepare, generalize, rewrite |
| Evaluation | <ul style="list-style-type: none"> • compare and discriminate between ideas • assess value of theories, presentations • make choices based on reasoned argument • verify value of evidence • recognize subjectivity • <i>Action Verbs:</i> assess, decide, rank, grade, test, measure, recommend, convince, select, judge, explain, discriminate, support, conclude, compare, summarize |

- Adapted from: Bloom, B.S. (Ed.) (1956) Taxonomy of educational objectives: The classification of educational goals: Handbook I, cognitive domain. New York ; Toronto: Longmans, Green.

Writing Student Learning Outcomes

Utilizing the Learning Domains and Bloom's Taxonomy you are ready to begin rewriting your learning outcomes in the appropriate format.

When writing Student Learning Outcomes, the focus should be on observable outcomes and an "action verb" can provide that focus. Student Learning Outcomes usually begin with something like:

By the end of the secondary education program, students will be able to **design** curriculum and instruction appropriate for the cognitive development of all learners.

Design is the "action verb" in this example.

By the end of the chemistry program, students will be able to **apply** knowledge of ions, solutions and solubility to **explain** the formation and properties of homogeneous mixtures.

Apply and **explain** are the "action verbs" in this example. The following are other action verbs that can be used in writing effective learning outcomes.

The following tables provide examples of learning outcomes written in the appropriate format at each level of the Cognitive (Table 1), Psychomotor (Table 2) and Affective (Table 2) domains. These will provide you with ideas of how you can rewrite your learning outcomes to make them more effective in evaluating student performance in your department.

Table 1: Cognitive (Knowledge) Domain

| Level | Action Verbs | Outcome Example |
|---------------|--|--|
| Knowledge | Recite, list, define, describe, identify, label, list, name, select, show | By the end of the chemistry program, students will be able to list all of the elements on the Periodic Table. |
| Comprehension | Translate, interpret, predict, generalize, identify examples, discuss, explain, paraphrase, report, restate, review | By the end of the French program, students will be able to translate a paragraph of text from English to French. |
| Application | Apply, rewrite complete, compute, construct, solve, demonstrate, use, operate, employ | By the end of the BIS program, students will be able to apply basic Web development skills |
| Analysis | Analyze, dissect, resolve, solve, diagnose, investigate, classify, categorize, compare, contrast, critique, differentiate, distinguish | By the end of the special education program, students will be able to diagnose learning disabilities in K-12 settings. |
| Synthesis | Create, synthesize, write, construct, design, formulate, integrate, organize, combine generalize | By the end of the art program, students will be able to create at least 12 original works in their medium. |
| Evaluation | Evaluate, judge, rate, appraise assess, score, value, recommend, grade | By the end of the music education program, students will be able to judge student performances. |

The affective domain includes a focus on students' attitudes, values and dispositions. These outcomes are a little more difficult to measure; however, it is possible, and many disciplines are including these in their national standards (e.g., Students should develop respect and understanding for people from all backgrounds and cultures and be able to engage in constructive discussion of significant social and ethical issues), as well as part of the General Education Requirements (e.g., Develop intellectual concerns to include a cross-cultural perspective through the study of diverse cultures).

Table 2: Affective (Values, Dispositions) Domain

| Level | Action Verbs | Outcome Example |
|-------------------------------------|---|---|
| Receiving | Attend, accept, listen, selectively attend to | By the end of the women's studies program, students will listen attentively to alternative views on select issues. |
| Responding | Comply with, approve, volunteer, applaud, acclaim | By the end of the elementary education program, students will be able to comply with PL 94-142. |
| Valuing | Increase proficiency in, relinquish, assist, support, deny, protest, debate | By the end of the political science program, students will be able to debate numerous sides to an argument. |
| Organization | Balance, organize, formulate, accommodate | By the end of the environmental studies program, students will be able to organize the conservation efforts of urban, suburban and rural communities. |
| Characterization by a value complex | Respect, interpret, use evidence, maintain objectivity | By the end of the counseling program, students will be able to objectively interpret evidence presented by clients during a therapy session. |

The Psychomotor Domain focuses on the development of students' physical abilities and skills. These Student Learning Outcomes may include performances, skill in a sport, typing skills, painting, playing an instrument, manipulating another person's limbs during physical therapy and demonstrating a dissection.

Table 3: Psychomotor (Skills) Domain

| Level | Action Verbs | Outcome Example |
|---------------------|--|---|
| Perception | Chooses, describes, detects, differentiates, distinguishes, isolates, relates, selects, separates | By the end of the music theatre program, students will be able to relate types of music to particular dance steps. |
| Set | Begins, displays, explains, moves, proceeds, reacts, responds, shows, starts, volunteers | By the end of the physical education program, students will be able to demonstrate the proper stance for batting a ball. |
| Guided Response | Assembles, builds, calibrates, constructs, dismantles, displays, dissects, fastens, fixes, grinds, heats, manipulates, measures, mends, mixes, sketches | By the end of the physical education program, students will be able to perform a golf swing as demonstrated by the instructor. |
| Mechanical Response | Assembles, builds, calibrates, constructs, dismantles, displays, dissects, fastens, fixes, grinds, heats, manipulates, measures, mends, mixes, sketches | By the end of the biology program, students will be able to assemble laboratory equipment appropriate for experiments. |
| Complex Response | Assembles, builds, calibrates, constructs, dismantles, displays, dissects, fastens, fixes, grinds, heats, manipulates, measures, mends, mixes, sketches, demonstrate | By the end of the industrial education program, students will be able to demonstrate proper use of woodworking tools to high school students. |
| Adaptation | Adapts, alters, changes, rearranges, reorganizes, revises, varies | By the end of the industrial education program, students will be able to adapt their lessons on woodworking skills for disabled students. |
| Origination | Arranges, combines, composes, constructs, creates, designs, originates | By the end of the dance program, students will be able to create a dance step. |

For additional information on writing learning outcomes you can view the following tutorial online at:

<http://www.vcu.edu/cte/resources/videos/WritingCourseObjectives/objectivestry4a.html>

To evaluate your revised learning outcomes, use the following checklist.

Table 4: Checklist of Learning Outcomes

Department:

| Objective | Describes one Behavior | Behavior is Observable | Behavior is Measurable | Appropriate level for the learner | Objective is critical to the field | Remove | Revise | Keep |
|-----------|------------------------|------------------------|------------------------|-----------------------------------|------------------------------------|--------|--------|------|
| 1 | | | | | | | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |

Comments:

Resources:

<http://www2.acs.ncsu.edu/UPA/assmt/resource.htm>

<http://academicaffairs.cmich.edu/caa/assessment/resources/toolkit.shtml>

- Bloom's 1956 taxonomy of cognitive, affective, and psychomotor behaviors is often used or referred to in defining outcomes for assignments, courses, and curricula. Google *Bloom's Taxonomy* for a long list of relevant websites. Some with definitions & examples of Bloom's cognitive categories are:
 - [Bloom et al.'s Taxonomy of the Cognitive Domain](#), from [Educational Psychology Interactive](#) at Valdosta State University.
 - [Bloom's Taxonomy](#), from the online textbook [Emerging Perspectives on Learning, Teaching, and Technology](#), presents the revised version developed by Anderson et al in the 1990s.
 - [Using the New Bloom's Taxonomy to Devise Meaningful Learning Assessments](#), from the American Psychological Association's [Assessment Cyberguide](#).

- [Learning Domains, or Bloom's Taxonomy](#) has examples from the affective and psychomotor domains as well as from the (old version of the) cognitive domain.
- College Learning Outcomes Study
www.alverno.edu/for_educators/ere_research.html
- College Learning for the New Global Century
www.aacu.org/leap/documents/GlobalCentury_final.pdf
- College Wide Student Learning Outcomes
columbia.yosemite.cc.ca.us/slo/college_wide_student_learning_outcomes.htm

Sample Objectives:

<http://academicaffairs.cmich.edu/caa/assessment/program/database.shtml>