

A Guide for Writing Student Learning Outcomes

**Institutional Assessment
Timothy S. Brophy, Director**

Website: <http://assessment.aa.ufl.edu/>

*Office of the Provost
University of Florida*

*Continuous Quality
Enhancement Series*

Student Learning Outcomes

Table of Contents

| | |
|--|----|
| Introduction..... | 2 |
| Differentiating Program Goals and Student Learning Outcomes | 2 |
| The Three R's of SLOs: Recency, Relevance, and Rigor..... | 3 |
| Outputs and Outcomes: What is the difference? | 3 |
| Components of Effective Student Learning Outcomes..... | 3 |
| Recommended Steps for Developing and Revising Student Learning Outcomes..... | 4 |
| Support | 5 |
| Table 1. The Knowledge Dimension – Bloom’s Revised Taxonomy | 5 |
| Table 2. The Cognitive Process Dimension – Bloom’s Revised Taxonomy..... | 6 |
| Table 3. Verbs for Bloom’s Taxonomy | 8 |
| Figure 1. The Taxonomy Table | 9 |
| Works Cited..... | 10 |

Student Learning Outcomes

Introduction

Because teaching is a primary mission of the University of Florida (UF), evidence of student learning is a measure of our success as an educational institution. Regional accrediting agencies across the United States require that universities provide evidence of student learning to demonstrate their effectiveness as educational institutions. *Student Learning Outcomes* (SLOs) specify what students will know and be able to do as a result of completing their degree programs¹. The Southern Association of Colleges and Schools Commission on Colleges (SACSCOC) Comprehensive Standard 3.3.1 states that

the institution identifies expected outcomes, assesses the extent to which it achieves these outcomes, and provides evidence of improvement based on the analysis of the results in each of the following areas: *education programs, to include **student learning outcomes***; ... (Southern Association of Colleges and Schools Commission on Colleges (SACSCOC), 2011, pp. 83-84)

Student Learning Outcomes (SLOs) are defined at UF as “what students are expected to learn by completion of their baccalaureate degree program” (University of Florida, 2011). Student Learning Outcomes at UF are organized into three broad categories: Content Knowledge, Critical Thinking, and Communication. In order to demonstrate SACS standard 3.3.1, student learning outcomes should be reviewed periodically and realigned with the evolving outcomes and expectations for students graduating from UF. [Institutional Assessment](#) provides support for university stakeholders in the development and implementation of measureable Student Learning Outcomes. This guide provides information to assist instructors and units in the development and review of Student Learning Outcomes.

What students learn in any degree program is determined by the faculty who teach the program. To ensure that the expectations for student learning are consensual, faculty should work together to determine/review/revise the SLO’s for their programs. Each undergraduate major at UF already has an Academic Learning Compact and Student Learning Outcomes (see <https://catalog.ufl.edu/ugrad/current/Pages/academic-learning-compacts.aspx>.) General Education SLOs are found at <https://catalog.ufl.edu/ugrad/current/advising/info/general-education-requirement.aspx#learning>. Graduate SLOs are found on the Institutional Assessment website at <http://assessment.aa.ufl.edu/slo-resources>.

Differentiating Program Goals and Student Learning Outcomes

Program Goals and Student Learning Outcomes are easily differentiated. SLOs describe student learning – what students will know and be able to do as a result of completing a UF program.

¹ These SLO’s are assessed as part of the Continuous Quality Enhancement process – see “Developing Individual Student Assessments” in the Continuous Quality Enhancement series.

Program Goals do not describe student learning – instead, they describe programmatic elements, such as admission criteria, acceptance and graduation rates, etc.

The Three R's of SLOs: Recency, Relevance, and Rigor

Student Learning Outcomes reflect the curriculum, and as curriculum evolves, learning outcomes change. Three guiding principles frame the review of existing SLOs: recency, relevance, and rigor. *Recency* has to do with the degree to which the outcome reflects current knowledge and practice in the discipline. *Relevance* is the degree to which the outcome relates logically and significantly to the discipline. *Rigor* has to do with the degree of academic precision and thoroughness that the outcome requires to be met successfully.

Outputs and Outcomes: What is the difference?

Outputs describe and count what we do and whom we reach and represent products or services we produce. Processes deliver outputs; what is produced at the end of a process is an output. For example, in a PhD student recruitment process the output might be 10 new PhD students. At the end of a degree program, the output might be a certain number of graduates.

An **outcome** is a level of performance or achievement. It may be associated with a process or its output. Outcomes imply measurement - quantification - of performance. Here are two examples: (1) after attending a study abroad program, students' intercultural competency improved by 20% as measured by the Intercultural Development Inventory (IDI); (2) as a result of increased external funding, 15 UF departments increased the number of graduate assistantships available by 20% over the previous reporting period.²

This distinction is important, especially in the development and review of Student Learning Outcomes. We seek to measure outcomes as well as their associated outputs; however, SLOs focus on outcomes. For example, while we produce a number of new graduates (the output), it is critical that we have a measure of the *quality* of the graduates as defined by the college or discipline (the outcome). Effective Student Learning Outcomes describe, in measurable terms, these quality characteristics by defining our expectations for knowledge, critical thinking, and communication for UF graduates.

Components of Effective Student Learning Outcomes

Effective SLOs :

1. *Focus on what students will know and be able to do.* All disciplines have a body of core knowledge that students must learn to be successful as well as a core set of applications of that knowledge in professional settings. Effective knowledge SLOs begin with phrases such as “Students know...”, “Students identify...” or similar verbs that specify a behavior that indicates knowledge acquisition.

When writing SLOs that focus on what students are able to do as a result of the program, select a verb that best describes the action involved in the observed behavior. A guiding question is: what cognitive processes or skills do students

² Examples are drawn from Internationalization Task Force meeting notes.

engage when demonstrating the behavior? For example, “Students analyze...”, “Students evaluate...” or similar verbs that specifically describe the behavior expected (see Table 3 for a more thorough list of verbs associated with Bloom’s Taxonomy).

2. *Describe observable and measurable actions or behaviors.* Effective SLOs present a core set of observable, measurable behaviors. Measurement tools vary from quizzes and tests to complex rubrics. There are some verbs to be avoided when writing SLOs, because they designate behaviors that are internal and not observable. Here is a list of verbs and phrases to avoid:

- Understand
- Appreciate
- Become familiar with
- Learn about, think about
- Become aware of , gain an awareness of
- Demonstrate the ability to

Bloom’s Taxonomy (Anderson, Krathwohl, Airasian, Cruikshank, Mayer, & Pintrich, 2001) is a widely accepted description of the dimensions of knowledge and cognitive skills that are used to formulate educational objectives. Student Learning Outcomes are the educational objectives of UF degree programs, so this taxonomy provides a valuable resource in developing measurable SLOs. Table 1 presents the Knowledge dimension levels and their descriptions. Table 2 presents the Cognitive dimension and the six levels of the hierarchy and their descriptions. Table 3 presents a list of specific verbs that engage students in processes that are observable and measurable.

Recommended Steps for Developing and Revising Student Learning Outcomes

1. Review the current SLOs for your area with your program faculty for recency, relevance, and rigor. Undergraduate SLOs are found at <https://catalog.ufl.edu/ugrad/current/Pages/academic-learning-compacts.aspx>). General Education SLOs are found at <https://catalog.ufl.edu/ugrad/current/advising/info/general-education-requirement.aspx#learning>, and graduate SLOs are found on the Institutional Assessment website at <http://assessment.aa.ufl.edu/slo-resources>.
2. Examine the SLOs for the Knowledge Type (see Table 1) and Cognitive Processes level (see Table 2) they engage. The majority of the SLOs should be in the upper three levels of the Cognitive Processes Dimension – Analyze, Evaluate, and Create. The Taxonomy template in Figure 1 may help with this process.
3. Cross-reference your SLOs with the list of verbs/actions associated with their corresponding cognitive dimension levels (see Table 3), and replace any “verbs and phrases to avoid” (see the above list) with appropriate verbs from Table 3.
4. Write the SLO concisely and clearly.

When you have reached consensus on the SLOs, submit your revisions through the ALC approvals system at <https://approval.ufl.edu/>. You will find instructions for using this system at <http://assessment.aa.ufl.edu/Data/Sites/22/media/slo/process-for-updating-or-revising-alc-s-and-slos.pdf>.

Support

Institutional Assessment staff members are available for assistance with training and workshops on how to develop/revise Student Learning Outcomes. Please contact Ashley Caspary at acaspary@aa.ufl.edu or 273-1090 to set up a workshop or training session.

Table 1. The Knowledge Dimension – Bloom’s Revised Taxonomy

| Major Types and Subtypes | Examples |
|--|--|
| A. Factual Knowledge – The basic elements students must know to be acquainted with a discipline or solve problems in it | |
| AA. Knowledge of terminology | Technical vocabulary, music symbols |
| AB. Knowledge of specific details and elements | Major natural resources, reliable sources of information |
| B. Conceptual Knowledge – The interrelationships among the basic elements within a larger structure that enable them to function together | |
| BA. Knowledge of classifications and categories | Periods of geological time, forms of business ownership |
| BB. Knowledge of principles and generalizations | Pythagorean theorem, law of supply and demand |
| BC. Knowledge of theories, models, and structures | Theory of evolution, structure of Congress |
| C. Procedural Knowledge – How to do something, methods of inquiry, and criteria for using skills, algorithms, techniques, and methods | |
| CA. Knowledge of subject-specific skills and algorithms | Skills used in painting with water colors, whole-number division algorithm |
| CB. Knowledge of subject-specific techniques and methods | Interviewing techniques, scientific method |
| CC. Knowledge of criteria for determining when to use appropriate procedures | Criteria used to determine when to apply a procedure involving Newton’s second law, criteria used to judge the feasibility of using a particular method to estimate business costs |
| D. Metacognitive Knowledge – Knowledge of cognition in general as well as awareness and knowledge of one’s own cognition | |
| DA. Strategic knowledge | Knowledge of outlining as a means of capturing the structure of a unit of subject matter in a textbook, knowledge of the use of heuristics |
| DB. Knowledge about cognitive tasks, including appropriate contextual and conditional knowledge | Knowledge of the types of tests particular teachers administer, knowledge of the cognitive demands of different tasks |
| DC. Self-knowledge | Knowledge that critiquing essays is a personal strength, whereas writing essays is a personal weakness; awareness of one’s own knowledge level |

From: Anderson, Krathwohl, Airasian, Cruikshank, Mayer, & Pintrich, 2001.

Table 2. The Cognitive Process Dimension – Bloom’s Revised Taxonomy

| Categories & Cognitive Processes | Alternative Names | Definitions and Examples |
|--|--|---|
| 1. Remember – Retrieve relevant knowledge from long-term memory | | |
| 1.1 Recognition | Identifying | Locating knowledge in long-term memory that is consistent with presented material (e.g., Recognize the dates of important events in U.S. history) |
| 1.2 Recalling | Retrieving | Retrieving relevant knowledge from long-term memory (e.g., Recall the dates of important events in U.S. history) |
| 2. Understand – Construct meaning from instructional messages, including oral, written, and graphic communication | | |
| 2.1 Interpreting | Clarifying, paraphrasing, representing, translating | Changing from one form of representation (e.g., numerical) to another (e.g., verbal) (e.g., Paraphrase important speeches and documents) |
| 2.2 Exemplifying | Illustrating, instantiating | Finding a specific example or illustration of a concept or principle (e.g., Give examples of various artistic painting styles) |
| 2.3 Classifying | Categorizing, subsuming | Determining that something belongs to a category (e.g., concept or principle) (e.g., Classify observed or described cases of mental disorders) |
| 2.4 Summarizing | Abstracting, generalizing | Abstracting a general theme or major point(s) (e.g., Write a short summary of the events portrayed on a videotape) |
| 2.5 Inferring | Concluding, extrapolating, interpolating, predicting | Drawing a logical conclusion from presented information (e.g., In learning a foreign language, infer grammatical principles from examples) |
| 2.6 Comparing | Contrasting, mapping, matching | Detecting correspondences between two ideas, object, and the like (e.g., Compare historical events to contemporary situations) |
| 2.7 Explaining | Constructing models | Constructing a cause-and-effect model of a system (e.g., Explain the causes of important 18 th -century events in France) |
| 3. Apply – Carry out or use a procedure in a given situation | | |
| 3.1 Executing | Carrying out | Applying a procedure to a familiar task (e.g., Divide one whole number by another whole number, both with multiple digits) |
| 3.2 Implementing | Using | Applying a procedure to an unfamiliar task (e.g., Use Newton’s Second Law in situations in which it is appropriate) |

Table 2, Continued

| Categories & Cognitive Processes | Alternative Names | Definitions and Examples |
|--|--|---|
| 4. Analyze – Break material into its constituent parts and determine how the parts relate to one another and to an overall structure or purpose | | |
| 4.1 Differentiating | Discriminating, distinguishing, focusing, selecting | Distinguishing relevant from irrelevant parts or important from unimportant parts of presented material (e.g., Distinguish between relevant and irrelevant numbers in a mathematical word problem) |
| 4.2 Organizing | Finding, coherence, integrating, outlining, parsing, structuring | Determining how elements fit or function within a structure (e.g., Structure evidence in a historical description into evidence for and against a particular historical explanation) |
| 4.3 Attributing | Deconstructing | Determine a point of view, bias, values, or intent underlying presented material (e.g., Determine the point of view of the author of an essay in terms of his or her political perspective) |
| 5. Evaluate – Make judgments based on criteria and standards | | |
| 5.1 Checking | Coordinating, detecting, monitoring, testing | Detecting inconsistencies or fallacies within a process or product; determining whether a process or product has internal consistency; detecting the effectiveness of a procedure as it is being implemented (e.g., Determine if a scientist's conclusions follow from observed data) |
| 5.2 Critiquing | Judging | Detecting inconsistencies between a product and external criteria, determining whether a product has external consistency; detecting the appropriateness of a procedure for a given problem (e.g., Judge which of two methods is the best way to solve a given problem) |
| 6. Create – Put elements together to form a coherent or functional whole; reorganize elements into a new pattern or structure | | |
| 6.1 Generating | Hypothesizing | Coming up with alternative hypotheses based on criteria (e.g., Generate hypotheses to account for an observed phenomenon) |
| 6.2 Planning | Designing | Devising a procedure for accomplishing some task (e.g., Plan a research paper on a given historical topic) |
| 6.3 Producing | Constructing | Inventing a product (e.g., Build habitats for a specific purpose) |

From: Anderson, Krathwohl, Airasian, Cruikshank, Mayer, & Pintrich, 2001.

Table 3. Verbs for Bloom's Taxonomy

| <u>Remember</u> | <u>Understand</u> | <u>Apply</u> | <u>Analyze</u> | <u>Evaluate</u> | <u>Create</u> |
|------------------------|--------------------------|---------------------|-----------------------|------------------------|----------------------|
| Arrange | Classify | Calculate | Combine | Appraise | Arrange |
| Define | Describe | Construct | Figure | Argue | Assemble |
| Locate | Identify | Classify | Find | Assess | Compose |
| Recall | Indicate | Estimate | Sketch | Defend | Create |
| Recite | Organize | Illustrate | Solve | Estimate | Design |
| Describe | Interpret | Interpret | Predict | Judge | Devise |
| Repeat | Illustrate | Appraise | Change | Predict | Formulate |
| Identify | Reorganize | Contrast | Survey | Qualify | Invent |
| Select | Translate | Criticize | Compare | Rate | Manage |
| Quote | Paraphrase | Diagnose | Diagram | Support | Modify |
| Label | Summarize | Identify | Examine | Critique | Organize |
| Copy | Transform | | Test | Recommend | Plan |
| List | Discuss | | Modify | | Prepare |
| Name | Explain | | | | Produce |
| State | Defend | | | | Propose |
| | Compare | | | | Set up |
| | Report | | | | Verify |
| | Restate | | | | Construct |
| | Review | | | | Develop |
| | Rewrite | | | | |

From: The Eberly Center for Teaching Excellence, Carnegie Mellon University (Carnegie Mellon University)

Figure 1. The Taxonomy Table

| The Knowledge Dimension | The Cognitive Process Dimension | | | | | |
|---------------------------------|--|-------------------|--------------|----------------|-----------------|---------------|
| | Remember | Understand | Apply | Analyze | Evaluate | Create |
| Factual Knowledge | | | | | | |
| Conceptual Knowledge | | | | | | |
| Procedural Knowledge | | | | | | |
| Meta-Cognitive Knowledge | | | | | | |

From: Anderson, Krathwohl, Airasian, Cruikshank, Mayer, & Pintrich, 2001.

Works Cited

- Anderson, L. W., Krathwohl, D. R., Airasian, P. W., Cruikshank, K. A., Mayer, R. E., & Pintrich, P. R. (2001). *A taxonomy for learning, teaching, and assessing - A revision of Bloom's taxonomy of educational objectives*. New York, New York: Addison Wesley Longman, Inc. (& M. J. Raths, Ed.) New York, New York: Addison Wesley Longman, Inc.
- Carnegie Mellon University. (n.d.). *Enhancing Education*. Retrieved July 27, 2011, from Bloom's Taxonomy: <http://www.cmu.edu/teaching/designteach/design/bloomsTaxonomy.html>
- Southern Association of Colleges and Schools Commission on Colleges (SACSCOC). (2011, March). *Southern Association of Colleges and Schools Commission on Colleges*. Retrieved July 14, 2011, from Southern Association of Colleges and Schools : <http://sacscoc.org/handbooks.asp>
- University of Florida. (2011). *Undergraduate Catalog*. Retrieved July 14, 2011, from Academic Learning Compacts: <https://catalog.ufl.edu/ugrad/current/Pages/academic-learning-compacts.aspx>