Developing Program Goals and Student Learning Outcomes

Office of Institutional Assessment
Dr. Timothy S. Brophy
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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. University of Florida faculty have engaged in responsible course and program assessment for decades because it is good practice. Continuous quality improvement is the goal of examining results and making decisions about how it can be better next time.

Accreditors across the nation require documentation of evidence that faculty plan for and assess Student Learning Outcomes, including evaluating results and using those results for program improvement. Accordingly, while UF collects this evidence annually for accreditation purposes, these best practices of assessment in the teaching and learning process are important efforts for continuous improvement that remain with the faculty.

Definitions

Academic programs: Academic programs at UF are defined as those that offer a credential such as a degree or certificate program for undergraduate, graduate, or professional students.

Program Goals (PGs) are broad statements of what the program intends to accomplish. These are internal goals and can be changed without any external approval beyond the department.

Student Learning Outcomes (SLOs) are a statement of what students should know and be able to do by the time they complete an academic program.

SLO Categories at UF:

	SLO 1	SLO 2	SLO 3
Undergraduate	Content	Communication	Critical Thinking
Graduate and Professional	Knowledge	Skills	Professional Behavior

Using Program Goals and Student Learning Outcomes at UF

Program Goals and Student Learning Outcomes describe how the program mission is operationalized, using the SLOs and PGs to form a blueprint of how the key principles of the program mission are met. SLOs and PGs are reviewed annually by the faculty and are periodically revised in response to outcome and goal data towards continuous quality improvement.

Program Goals and Student Learning Outcomes (a) should be consistent with the mission of the university, college, and department, and (b) align with the values of the faculty.

While Program Goals can be changed at any time without approval by the department, there is an approval process for changing SLOs or other details of the Academic Assessment. Changes for SLOs and related assessment activities are reviewed and approved by the Academic Assessment Committee.

Outputs and Outcomes: What is the difference?

Outputs describe and count what we do, 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, A Ph.D. program goal output might 10 new PhD students. At the end of a degree program, the output might be a certain number of graduates. Another example of output could be the number of graduates at the end of a degree program.

An outcome is a level of performance or achievement. It may be associated with a process or its output. Outcomes imply measurement of performance or achievement.

Here are two examples which measure student learning that is observable and measurable through assessment:

- Students analyze experimental data and interpret results in the cellular and molecular sciences.
- Students discriminate musical quality based on sound musical reasoning.

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.

Developing Program Goals

Program goals include the broad educational goals of the program (i.e., to graduate students who are prepared for the workplace) and programmatic elements such as, but not limited to, the following:

- Total number of students enrolled
- Percent of admits from those who applied
- Percent matriculated from those admitted
- Median time to degree
- Percent attrition rate
- Percent completion rate
- Number of graduates
- Number of graduates produced per budgeted faculty position

Goals are measured by establishing specific actions that will provide data that inform the faculty of the progress they are making toward achieving the goal.

Tip: Find easy ways to collect and/or review the data, such as enrollment data which UF can provide. Does the department seek to grow, or reduce size? If you use a student survey, be sure to require completion of that survey.

Goal Format

Goal statements are usually structured as follows:

"To (action verb) (object) (modifiers)

Examples of educational program goals:

- To graduate students who are prepared to be independent researchers."
- To adequately prepare students for graduate school."

Examples of program goals including programmatic elements:

- To increase the number of our degree-seeking students by 10% in 2025-26
- To hire two new faculty members in our program.

Developing SMART Goals

Drawing from management literature in the 1980's, the acronym SMART is a simple way to recall the best type of goals: specific, measurable, attainable, relevant, and time-limited or time-sensitive (Doran, 1981). SMART goals are appropriate for setting educational goals also.

Specific

- What do we want to accomplish?
- Why: Specific reasons, purpose or benefits of accomplishing the goal
- Who: Who is involved?
- Which: Identify requirements (essential attributes) and constraints

Measurable

- Need to establish concrete criteria for measuring progress toward the attainment of the goal
- Measurable goals use active verbs to describe specific expectations
- Measuring progress helps you to stay on track, reach target dates, and experience the success of achievement
- Guiding questions: How much are we looking for? How many are we seeking? How will I know when it is accomplished?

Attainable

- Goals must be realistic and attainable
- Attainable goals may stretch a team to achieve it, the goal is not extreme
- Goals are neither out of reach nor below standard performance, as these may be considered meaningless
- When you identify goals that are most important to you, you begin to figure out ways you can make them come true. You develop the attitudes, abilities, skills, and financial capacity to reach them
- According to theory, an attainable goal may cause goal-setters to identify previously overlooked opportunities to bring themselves closer to the achievement of their goals.
- Guiding questions: How can the goal be accomplished? Does the goal represent an objective toward which you are both willing and able to work?

Is the goal both high and realistic? Does the goal represent substantial progress?

Relevant

- Relevant goals
    - Are worthwhile
    - Are set at the right time
    - Match other efforts/needs
    - Are assigned to the right person/area/group
    - Can be modified as needed

Time-limited or Time-sensitive

- This part of the SMART goal criteria is intended to prevent goals from being overtaken by the day-to-day crises that invariably arise in the academy
- `Goals must be grounded within a time frame, giving them a target date
- A commitment to a deadline helps a team focus their efforts on completion of the goal
- Tips for designing time-limits:
    - Provide a timeframe for the completion of the goal
    - Describe what can be done in 6 months, 6 weeks, or today
    - Set a sequence of activities that will serve as benchmarks for achieving the goal

Developing Student Learning Outcomes

The Three R's of SLOs: Recent, Relevant, and Rigorous

Student Learning Outcomes reflect the curriculum, and as curriculum evolves, learning outcomes change. SLOs should be recent, relevant, and rigorous. Recent outcomes reflect current knowledge and practice in the discipline. Relevant outcomes relate logically and significantly to the discipline. Rigorous outcomes require an appropriate degree of academic precision and thoroughness to be met successfully.

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 describe….", "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 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, as they are too broad:

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

Bloom's Taxonomy (Krathwohl, 2002) 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. One set of useful information including visualizations of Bloom's Taxonomy can be found at the UF Center for Instructional Technology and Training.

In this document, three tables from Anderson and Krathwohl (2001) are presented to summarize Bloom's Taxonomy. 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.
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.

Submitting Revised SLOs for approval

Any major changes of content or intent in an SLO must go through the revision process with the Academic Assessment Committee. This would include a change in curriculum or process to measure the outcomes, or something similar.

Support

Institutional Assessment staff are available for assistance as you develop/revise Program Goals and Student Learning Outcomes, or related materials.

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 watercolors, 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

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 18th-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)
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	Draw some inferences and conclusions
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)
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)

Table 3. Verbs for Bloom's Taxonomy

Remembering	Understanding	Applying	Analyzing	Evaluating	Creating
Recall specific facts	Grasp meaning of materials	Use information in a new situation	Identify schemas or relationships	Use information to make judgments	Create or develop something new
define describe examine identify label list locate match memorize recall recite recognize record reproduce retell select state tabulate tell visualize	associate classify compare contrast convert describe discuss distinguish explain illustrate interpret order predict relate report represent restate select summarize trace transform translate	apply articulate calculate change chart compute construct develop employ examine experiment explain illustrate interpret manipulate modify operate predict produce relate solve transfer	analyze categorize compare connect contrast criticize deduce diagram differentiate discriminate dissect estimate evaluate experiment infer organize plan prioritize question separate survey test	appraise argue assess choose convince critique debate defend editorialize estimate evaluate grade judge justify measure persuade predict rank rate reframe summarize support	adapt assemble compose construct create design develop facilitate hypothesize integrate invent modify negotiate plan propose revise role-play schematize simulate speculate support validate

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