



WRITING LEARNING OUTCOMES USING BLOOM'S REVISED TAXONOMY

DISTINCTION – LEARNING GOALS vs. LEARNING OUTCOMES

When developing student learning outcomes, it is important to distinguish between broad course goals – focused on content the instructor intends to communicate – and more specific learning outcomes that focus on what the students will *know* or be able to *do* by the end of a learning experience.

In trying to answer the question “What do I want my students to be able to do by the end of ... (today’s class, this assignment, my course, etc.)?” instructors often use verbs such as those in the left column below, followed by important course content. For example, “I want my students to understand key events in late 20th century European history.” Such a broad goal is a good place to start, and these kinds of goals can be very useful in helping you identify the importance or scope of a topic. However, phrasing your goals in such general terms creates a challenge for determining whether students have achieved them. How do you measure “understanding”, “appreciation”, “knowledge” or “familiarity”? What evidence would demonstrate students’ achievement of these goals?

Course goals are:

- broad statements of teaching intention (i.e., they indicate what content you intend to cover in your course);
- focused on long-range intended concept and skills;
- usually written using abstract terms and phrases like appreciate, understand and become familiar with;
- expressed in 3 to 5 statements.

I want students to be able to:

GENERAL GOALS	As the instructor, how do I know?	SPECIFIC OUTCOMES
Know		Analyze
Learn	...because students can...	Solve
Understand		Compare
Appreciate		Critique
Value		Evaluate

(Adapted from Linse, A. (2011), Schreyer Institute for Teaching Excellence at The Pennsylvania State University.
Linse in turn adapted her text from Walvoord, B., (1998), Kaneb Center for Teaching and Learning, University of Notre Dame.)

Documenting and tracking student learning is easier if you specify what you would like students to do with the course content. In the right column above are examples of verbs that involve specific actions, observable behaviours, measurable achievements and/or student products. Once you have a list of 3-5 goals, you can translate them into effective learning outcomes which you can use to guide your decisions about course content, teaching methods and assessment.

DRAFTING LEARNING OUTCOME STATEMENTS

When crafting student learning outcomes, it can be useful to consult a learning taxonomy to identify the kinds of learning you would like to foster in your course. Bloom’s Taxonomy—developed by educational theorist Benjamin Bloom in the 1950s and revised by Krathwohl et al. in 2001—identifies three domains of learning: cognitive (knowledge), affective (attitudes), and psychomotor (skills). The cognitive domain highlights intellectual outcomes and is further divided into six specific categories or levels:





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Evidence shows that students retain more information in a course setting when they discuss, practice by doing, or teach others (Marzano, R. J. and Kendall, J.S., (2008), *Designing & Assessing Educational Objectives: Applying the New Taxonomy*, Thousand Oaks: Corwin Press; Maki, P.L., (2010), *Assessing for Learning: Building a Sustainable Commitment Access the Institution*, 2nd ed., Sterling: Stylus Publishing, 2010). To truly tap into higher-order learning and thinking, students should analyze, evaluate and create. A well-developed course should aim to cycle through these various levels of cognitive development, culminating in the upper levels, and the course learning outcomes should correspond to appropriate levels of learning. Our goal is for students to do more than remember—they should also be able to apply what they have learned in other contexts beyond the course itself.

To sum up, there are some key differences between course goals and course learning outcomes. Student learning outcomes:

- are student-centred;
- speak directly to students;
- align content, activities, and assessment;
- tell students the purpose of the learning;
- articulate to students how they are expected to apply their newly-acquired knowledge, skills and attitudes;
- are narrow and specific;
- are observable and measurable to verify that learning has been accomplished;
- are typically expressed in 5 to 10 statements.

An effective course will move students through the various levels of cognitive development. As students are introduced to course concepts and then given opportunities to practice applying them in increasingly complex ways, course learning outcomes should ideally reflect and speak to the different levels of learning in a course.

The chart below provides definitions and attributes for each of the six levels of Bloom's Revised Taxonomy, along with action verbs that can be used when developing learning outcomes. Also included are examples of learning outcomes from across different disciplines.

Chart adapted from: Anderson, L.W., Krathwohl, D.R. (2001). *A taxonomy of learning, teaching, and assessing*. Boston: Allyn and Bacon. Also from the Center for University Teaching, Learning, and Assessment, University of West Florida and the Center for Teaching and Learning, University of Texas.

Level	Level Definition & Attributes	Action Verbs	Example of Learning Outcomes
Level 1: Remember	Students exhibit memory of previously learned materials by recalling facts, terms, basic concepts, and simple answers.	choose, define, find, how, label, list, match, name, omit, recall, relate, select, show, spell, tell, identify, describe, copy, locate, recognize, memorize, quote, reproduce, tabulate, discover, duplicate, listen, enumerate	Physics: By the end of this course, students will be able to recite Newton's three laws of motion.





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Level	Level Definition & Attributes	Action Verbs	Example of Learning Outcomes
Level 2: Understand	Students demonstrate understanding of facts and ideas by interpreting, exemplifying, classifying, summarizing, inferring, comparing and explaining main ideas.	classify, compare, contrast, extend, demonstrate, explain, illustrate, infer, interpret, outline, relate, rephrase, show, summarize, select, translate, describe, paraphrase, ask, differentiate, discuss, express, distinguish, restate, group	History: By the end of this course, students will be able to explain the causes of the French Revolution.
Level 3: Apply	Students solve problems in new situations by applying acquired knowledge, facts, techniques and rules in a different way.	calculate, predict, apply, solve, illustrate, use, demonstrate, determine, model, build, construct, develop, experiment with, identify, make use of, organize, plan, select	Engineering: By the end of this course, students will be able to calculate the kinetic energy of a projectile.
Level 4: Analyze	Students are able to examine and break information into parts by identifying motives, causes and relationships. They can make inferences and find evidence to support generalization.	classify, outline, break down, categorize, analyze, diagram, illustrate, assume, compare, conclusion, contrast, discover, dissect, distinguish, divide, examine, function, inference, inspect, list, motive, relationships, simplify, survey, take part in, test for	English: By the end of this course, students will be able to determine key elements of William Shakespeare's political perspective.
Level 5: Evaluate	Students are able to present and defend opinions by making judgments about information, validity of ideas, or quality of work based on a set of criteria. They can justify a decision or course of action.	design, formulate, build, invent, create, compose, generate, derive, modify, develop, agree, appraise, assess, award, choose, compare, conclude, criteria, criticize, decide, deduct, defend, determine, disprove, estimate, evaluate, explain, influence, judge, interpret, justify, mark, measure, perceive, prioritize, rate, recommend, rule on, select, support, value	Economics: By the end of the course, students will be able to apply discrete and continuous probability distributions using industry standard statistical software, in order to evaluate the probability of real world events.
Level 6: Create	Students are able to compile, generate or view information, ideas or products together in a different way by combining elements in a new pattern or by proposing alternative solutions.	adapt, build, change, choose, combine, compile, compose, construct, create, delete, design, develop, discuss, elaborate, estimate, formulate, happen, imagine, improve, invent, make up, maximize, modify, originate, plan, predict, propose, solve, suppose, test, hypothesize, substitute, compile, develop, rearrange, anticipate, assemble, collaborate, collect, devise, imagine, intervene	Chemistry: By the end of this course, students will be able to design and execute synthetic and analytical experimental procedures found in the scientific literature in physical and inorganic chemistry.

Once you are able to clearly determine what students will be doing to practice and demonstrate their newly acquired knowledge and skills at each level of learning, you can develop effective learning outcomes that can help both you and your students track your students' progress through the course. Remember that outcomes should not simply refer to course content. In other words, they must be observable, measurable and expressed to show what learners will *do* and what they will *achieve*. Flowing from your general course goals and student learning outcomes, all components of your teaching—teaching strategies and methods, assessment and feedback—can then be closely aligned to create a coherent course structure that will help students achieve significant learning.

