Writing Outcomes or Learning Objectives

The purpose of creating learning outcomes or objectives is to help plan your course strategically and to communicate this plan to students. This is done by writing learning outcomes or learning objectives statements that describe what students should know and be able to do as a result of taking your course.

There is a philosophical debate over the nature and purpose of learning outcomes as opposed to learning objectives, and differences between them. This article avoids this debate, other than to say that whatever you call them, students need statements that specify what they will know and be able to do, and instructors need those statements in order to select appropriate learning and assessment activities.

This article focuses exclusively on writing outcome/objective statements. To see how learning outcomes/objectives fit into the overall course (e.g., selection of learning and assessment methods), see the related article on the **course syllabus**. [links to http://unbtls.ca/teachingtips/coursesyllabus.html]

Outcomes/objectives statements should, of course, be brief, clear and specific. They should also:

- State how students will demonstrate what they should know and can do
- Be written from the student's point of view
- Be easy to link to an appropriate assessment method
- Connect directly to program and curriculum outcomes or objectives.

It's difficult to overstate that when writing outcome/objectives statements, keep your audience in mind. Review the statements repeatedly and imagine what students would think of them and do with them.

Outcome/objectives statements ideally have several parts, each part providing some information that is helpful for selecting teaching and assessment methods:

- The **action**, the thing students must do to demonstrate they have mastered the objective
- The **conditions** under which this action is demonstrated
- The **performance standard** to which the action must comply to consider the outcome/objective having been achieved.

See the two examples below:

1. Students will use specified tool and visual templates to compile data into tables, charts.

   Action: use

   Conditions: specified tools and visual templates

   Performance standard: "accurately" is implied.

2. Given a defined scope, identify the mathematical, scientific and engineering principles necessary to model a system or process, and combine the principles to formulate a model to communicate a well-formed solution which predicts or simulates behaviour of a system or process.

   Actions: identify, combine, formulate, and communicate

   Conditions: given a defined scope

   Performance standard: [the student proposed solution] predicts or simulates behaviour of a system or process.

Learning Outcomes Constituent Parts

The table below is intended to supply helpful information for writing outcomes/objectives statements. The action column focuses on descriptive verbs, but the essential feature used to determine which learning level the action involves is the context indicated by the phrase in which the verb is placed. Thus, some verbs can be used in more than one learning level.

Also, learning is more complex than simply using a neat formula with conveniently delineated steps. Learning and assessment activities usually involve a mix of learning levels. However, the categories in the table are useful for thinking through the details of designing and implementing learning activities.

It is typical as well for students to be taken through lower learning levels before they can achieve higher ones.

Bloom's Learning Level	**The Point**	**Action**	**Conditions**	**Performance Standard**
Knowledge	Students identify or explain concepts in the words with which they were taught.	classify, compare and contrast (in the sense of which of these things is not like the others…), complete the diagram/ statement/ flowchart/table, differentiate between, draw, identify, match, give the definition of, name, find, label, list, locate, select, state, write the equation/ formula	• Given a list of examples and nonexamples • Given scenarios, diagrams… • Given a properly labelled table, flowchart, etc. fill in the missing… • Given a problem like the ones presented in class • Following a presentation on the concept… • Given a formula or method • Given a specific instrument	Phrases that indicate the level of: • accuracy • completeness • percent of correct responses • within a given time period • in compliance with criteria checklist • speed, automaticity In many cases, the mark is the standard. Whether it is sufficient depend on the pass mark for the course. In such cases, it is implied and need not be written into the outcome/ objective.
Compre-hension	Students explain concepts in their own words.	compare and contrast (in the sense of explaining how two or more things are alike and not alike), depict,	• Given time to review notes • Given a list of terms • Given general guidelines or principles • Given an overarching framework	Phrases that indicate the level of: • correctness/ consistency/ completeness • accuracy • congruence with experts

Bloom's Learning Level	The Point	Action	Conditions	Performance Standard
		describe, discuss, draw or otherwise represent, explain, infer, interpret, give examples, illustrate, paraphrase, review and infer, report, restate in your own words, show how, summarize, translate	• Given several options of representational media/methods • Given a problem, scenario, or diagram containing only relevant information, properly identified • Following group/ peer discussion on • Given a formula or method • Given a specific instrument • Without a specific instrument	• reasonableness • logic • accuracy/ speed/ automatically
Application	Students use concepts to solve problems and/or perform tasks.	apply, calculate, demonstrate, develop, dramatize, employ, exhibit, extend, find related research, generalize, implement, integrate, interpret, illustrate the use of, operate, organize, practice the implementation of, prepare, produce, restructure, relate, show, use, solve	• Given specific equipment • Given a range of equipment choices • Without specific equipment • Given a scenario and simulated setting with other classmates playing roles, • Given general guidelines or principles • Given an overarching framework • Given a problem, scenario, or diagram containing only relevant information, properly identified • Given a problem, scenario, or diagram containing relevant and irrelevant information, unidentified • Given a formula or method • Given a range of formulae and methods	Phrases that indicate the level of: • time on task • within a given time period • process relevance • correctness/plausibility • reasonableness/ plausibility • intensity • logic of inclusion/inference • mindfulness • commitment • effectiveness/efficiency of solution strategy

Bloom's Learning Level	The Point	Action	Conditions	Performance Standard
			• Given a lab assignment with specific steps • Given a lab assignment with general instructions • Given a scholarly article or articles • Given general search parameters • Given a task list • With or without a detailed step-by-step guide • With or without expert guidance	
Analysis	Students use concepts to determine the nature of phenomena so that a problem can be solved.	analyze, categorize, collect compare, contrast, classify, deduce, detect, determine significance of, differentiate between, discover, discriminate, dissect, examine, experiment, infer, inquire, inspect, investigate, predict, probe, reveal, scrutinize, separate, survey, uncover	• Given specific data • Given no data set • With or without an organizing scheme • With or without specified digital tools • With or without expert guidance • With or without heuristic, key, formula set, method • With or without a task list • With or without a detailed step-by-step guide • With guiding theories and frameworks provided/not provided • With or without problem solving models • With or without a bibliography of resources	Phrases that indicate the level of: • process relevance • correctness/ plausibility • reasonableness/ plausibility • intensity • logic of inclusion/ inference • mindfulness • commitment

Bloom's Learning Level	The Point	Action	Conditions	Performance Standard
Synthesis	Students use concepts to create something original.	arrange, assemble, combine, compose, construct, create, derive, design, develop, develop, formulate, generalize, invent, modify, originate, organize, plan, produce, propose, prepare, relate, set up, resolve, solve, write	Usually phrases that indicate the presence, partial presence, or absence of tools, frameworks, models, resources, guidance, and other such "scaffolding" provided.	Phrases that indicate the level of: • innovation • originality/variety/ efficiency • congruence with problem space/ elegance • compellingness • reasonableness, plausibility • logic • mindfulness • commitment • effectiveness/ efficiency of solution strategy
Evaluation	Students critique concepts (existing or synthesized) based on overarching principles or frameworks, the underlying assumptions of which are also evaluated. At the higher level of "Is this the optimal approach?" rather than "Is the thing we created good?"	appraise, argue, assess, choose, compare, conclude, consider, critique, decide, deconstruct, deduce, evaluate, infer, judge, measure, rate, select, validate, value, weigh	Usually phrases that depict exploratory, minimally guided, open and resource rich learning environments.	Phrases that indicate the level of: • rigour • thoroughness • consistency • completeness • congruence (between item and context, as well as with expert opinion) • complexity • elegance • appropriateness • effectiveness • depth • balance between detail and big picure

Examples

Consider the following examples of well-written learning outcomes/objectives:

1. Upon completion of [this French] course, students will be able to make themselves understood in basic everyday communicative situations in a Francophone environment.
2. Students will be able to accurately translate short, previously unseen texts from German.
3. Given a research problem, students will be able to identify and demonstrate facility in research designs and data collection strategies that are most appropriate to a particular research project and effective in meeting the project goals.
4. Given a research issue, students will formulate a complete and logical plan for data analysis that will adequately answer the research questions and probe alternative explanations.
5. Conduct an open technology assessment to choose a set of tools, and exploit their features to compile data in to tables, charts and plots, to prepare engineering drawing using appropriate graphical standards, and to integrate graphical and textual components within verbal and written communications.
6. Given a topic to investigate, students will be able to find and interpret the most relevant research findings and draw appropriate conclusions.
7. By the end of this course, students will be able to analyze qualitative and quantitative data, and explain how evidence gathered supports or refutes an initial hypothesis.
8. Given a list with both previously encountered and new microscopic images, students will be able to provide accurate diagrams of cells and be able to classify cells.
9. By the end of this course, students will be able to identify and develop original data collection instruments and measures for planning and conducting sociological research.
10. Students will use concepts and formulas provided to predict the appearance and motion of visible celestial objects.
11. Upon completion of the course, students will be able to describe, evaluate, and communicate the impact of research and other accomplishments in space technology on our understanding of scientific theories and principles and on other fields of endeavour.
12. By the end of this course, students will be able to categorize macroeconomic policies according to the economic theories from which they emerge.
13. By the end of this unit, students will be able to describe the characteristics of the three main types of geologic faults (dip-slip, transform, and oblique) and explain the different types of motion associated with each.
14. Students will apply basic economic principles in decision-making to example engineering projects, identify economic constraints, and choose appropriate alternatives, based on those economic and financial considerations.

15. With no scope defined, students will identify the mathematical, scientific and engineering principles necessary to model a system or process, and combine the principles in a new way to formulate a model to communicate a well-formed solution which predicts or simulates behavior of a system or process.

The Affective Domain

All of the above applies primarily to the cognitive domain. However, there is a vitally impactful affective domain component to learning that is too often taken for granted. The affective domain has to do with how much students care about what they are learning, and to what extent they internalize the attitudes and values of the discipline. To become competent practitioners of a discipline, students must be fully engaged with it and be committed to its values and practices. Students should increasingly see themselves not as science students but scientists, for example, with a worldview that values and uses scientific methods and practices (Carleton University, undated).

Teaching methods that address affective domain outcomes often involve group processes and competencies that require judgement and that integrate conflicting experiences and incomplete information sets in which students tackle complex real-world examples (Shephard, 2008).

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