LEARNING OUTCOMES

Learning Outcomes: What students will know and be able to do as a result of engaging in the learning process. Learning outcomes represent statements of achievement expressed from the learner’s perspective: At the end of the course, learners will know… and be able to do…

Terms/Clarification/Examples

Program Learning Outcomes:
Competencies (knowledge, skills, values) achievable after completion of an entire program of study.
Examples:

1. Materials Engineering: At the end of the program, students will be able to characterize and select materials for design by evaluating the linkages between material properties, microstructures and processing.

Course Learning Outcomes:
Knowledge, skills, values gained through course completion.
Examples:

1. 1st yr Geoscience Lab: Make interpretations and draw conclusions about Earth systems using observations and analyses.
2. Introductory Minerals: After this course, students will use observations about minerals and rocks to infer geological processes and economic potential.
3. Nursing Clinical: The student is able to perform a comprehensive history and physical examination of patients in the outpatient setting and the general medical wards, excluding critical care settings.
4. Sociology: By the end of this course, students will be able to identify and develop data collection instruments and measures for planning and conducting sociological research.

Unit/Topic/Module/Activity Outcomes: Knowledge, skills, values obtained during completion of a unit/topic/module (could last one hour or 3 weeks).
Examples:

1. 1st yr Geoscience Lab: Approximate the location of an earthquake using seismograph data provided, and consider possible errors.
2. Geology: 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.
Class Session/Online Session Learning Outcomes: Specific competencies (knowledge, skills, values) gained during one meeting (online or face to face).

Examples:

1. At the end of this workshop, you will be able to:
   a. Describe what is meant by the term Learning Outcome.
   b. Discuss Bloom’s Taxonomy of Educational Objectives.
   c. Apply Bloom’s Taxonomy to help you to write learning outcomes.
   d. Design an aligned Learning Outcomes/Assessment plan for your course.
   e. Recognize the advantages of Learning Outcomes.
   f. Assess the problems created by poorly written Learning Outcomes.

Learning Outcomes:

- Identify specifically what should be learned
- Serve as guidelines for content, instruction & assessment
- Must be achievable and measurable
- Should connect directly to the assessment criteria that are used to judge achievement
- Focus on learning rather than teaching
- Should be shared with the learner so that expectations are transparent
- Should reflect 3 domains/6 significant learning categories
  1. Cognitive (knowledge and intellectual skills with an emphasis on knowing, conceptualizing, comprehending, applying, synthesizing and evaluating)
  2. Affective (changes in interests, attitudes, values)
  3. Psychomotor (manipulative and motor skills)
Fink’s Taxonomy of Significant Learning

Figure 1

A TAXONOMY OF SIGNIFICANT LEARNING

LEARNING HOW TO LEARN
- Becoming a better student
- Inquiring about a subject
- Self-directing learners

FOUNDATIONAL KNOWLEDGE
- Understanding and remembering:
  - Information
  - Ideas

APPLICATION
- Skills
- Thinking:
  - Critical, creative, & practical thinking
  - Managing projects

INTEGRATION
- Connecting:
  - Ideas
  - People
  - Realms of life

CARING
- Developing new:
  - Feelings
  - Interests
  - Values

HUMAN DIMENSION
- Learning about:
  - Oneself
  - Others
How do I write Learning Outcomes?

Bloom’s Taxonomy of Educational Objectives is a great resource and starting point for writing Learning Outcomes. The Taxonomy consists of a hierarchy of increasingly complex processes which we want our students to acquire. The taxonomy provides a structure for learning outcomes.

Use a standard beginning like:

“Upon successful completion of this module, the student will be able to …..”

Bloom’s Taxonomy:

Knowledge: Collect, describe, examine, find, identify, recall, record, show

Examples:
List the criteria to be taken into account when caring for a patient with tuberculosis.
Define what behaviours constitute unprofessional practice in the solicitor-client relationship.

Comprehend: associate, clarify, contrast, differentiate, distinguish, estimate, illustrate

Examples:
Differentiate between civil and criminal law.
Identify participants and goals in the development of electronic commerce.
Predict the genotype of cells that undergo meiosis and mitosis.

Explain the social, economic and political effects of World War 1 on the post-war world.

Application: calculate, compute, construct, modify, relate

Examples:
Construct a timeline of significant events in the history of Australia in the 19th century.

Apply knowledge of infection control in the maintenance of patient care facilities.

Select and employ sophisticated techniques for analysing the efficiencies of energy usage in complex industrial processes.

Modify guidelines in a case study of a small manufacturing firm to enable tighter quality control of production.
**Analysis:** arrange, break down, connect, debate, infer

Examples:

Calculate gradient from maps in m, km, %, and ratio.

Compare the classroom practice of a newly qualified teacher with that of a teacher of 20 years teaching experience.

**Synthesis:** generalize, integrate, summarize

Examples:

Propose solutions to complex energy management problems both verbally and in writing.

Summarize the causes and effects of the 1917 Russian revolutions.

Organize a patient education program.

**Evaluation:** conclude, convince, measure, recommend, revise

Examples:

Assess the importance of key participants in bringing about change in Irish history.

Evaluate marketing strategies for different electronic business models.

Predict the effect of change in temperature on the position of equilibrium.

**Checklist for writing Learning Outcomes:**

1. Have I begun each outcome with an active verb?
2. Have I avoided terms like understand, know, learn…?
3. Have I included learning outcomes across the range of levels of Bloom’s Taxonomy?
4. Are the Learning Outcomes observable and measurable?
5. Do all the Learning Outcomes fit within the aims and content of the module?

**Reflective Questions When Designing Your Learning Outcomes:**

1. What is it that you want students to know and be able to do?
2. What do you want the students to have at the end of the course?
   a. Breadth (cover all material, remember facts, list answers, follow direction)
   b. Depth (develop critical thinking skills, ability to research information, apply analysis to situations, develop process)
3. What would distinguish students who have taken this course from students who have not?
How do I link Learning Outcomes to Teaching and Assessment?

Learning Outcomes should be aligned with your assessment pieces and learning activities.

Once you have identified your learning outcomes you can identify your assessment pieces (how the achievement of those L.O.’s will be measured) and then choose learning activities that will assist/support the students in successfully achieving those learning outcomes.

Alignment is when the:

- **Learning Outcomes** articulate the knowledge and skills you want students to acquire by the end of the course

- **Assessments** allow the instructor to check the degree to which the students are meeting the learning outcomes

- **Instructional Strategies** are chosen to foster student learning toward meeting the learning outcomes
What are the benefits and potential problems of Learning Outcomes?

Benefits:

1. Help explain more clearly to students what is expected of them and thus helps to guide them in their studies.
2. Help faculty to focus more clearly on what exactly they want students to achieve in terms of knowledge and skills.
3. Help faculty define the assessment criteria more effectively.
4. Help to provide guidance to employers or external agencies about the knowledge and understanding possessed by graduates of programs.

Potential Problems:

1. Set artificial boundaries on learning.
2. Assessment-driven curriculum.

RESOURCES:

http://www.ncgia.ucsb.edu/education/curricula/giscc/units/format/outcomes.html


http://www.uoguelph.ca/vpacademic/avpa/pdf/LearningOutcomes.pdf

http://library.iated.org/view/OLSEN2013DOC

http://www.saea.uottawa.ca/cpu/index.php?option=com_k2&view=item&layout=item&id=228&Itemid=&lang=en#1