

Types and levels of educational objectives

Bloom's Taxonomy of Educational Objectives (1956) is a well-known, detailed and structured framework that can be used for identifying and writing learning outcomes. The Taxonomy identifies three domains of educational outcomes: **cognitive, skills and affective**. A team of educational psychologists, headed by Benjamin Bloom, formulated a classification of educational activities in 1956, which is widely known as Bloom's Taxonomy. They went on to develop a classification system for the cognitive and affective domains but did not complete the system for the skills domain. Other researchers have since developed a classification system for the skills domain (Bloom, Englehard, Furst, Hill, and Krathwohl, 1956; Gronlund, 2000; Krathwohl, Bloom, and Masia, 1964; Harrow, 1972; and Simpson, 1972).

Cognitive:

This domain involves knowledge recall and intellectual skills (such as comprehending, organizing ideas and analyzing data). The classification system divides the cognitive skills into six levels ranging from simple outcomes (behaviors) to the most complex outcomes (behaviors). Bloom's six cognitive domain levels ranging from basic to most complex are: knowledge, comprehension, application, analysis, synthesis, and evaluation. A brief description of each is provided below.

Cognitive	Description
1. Knowledge (represents lowest level of learning)	Ability to observe and remember previously learned information; knowledge of specific facts, terms, concepts, principles, ideas, events, places, etc.; mastery of subject material.
2. Comprehension (represents lowest level of understanding)	Ability to understand information and grasp material; translating knowledge from one form to another; interpreting, comparing and contrasting material; predicting consequences and future trends.
3. Application (represents higher level of understanding)	Ability to use information, learned material, methods, concepts, theories, principles, laws and theories in new situations; problem solving using required knowledge or skills.
4. Analysis (represents a higher intellectual level)	Ability to break down material and recognition of organization structure; identification of components and relationships between components; recognition of patterns and hidden meanings.
5. Synthesis (represents a higher intellectual level)	Ability to combine parts or apply prior skills and knowledge to produce a new whole; integrate ideas into a solution; generalize from given facts; propose a plan of action; formulate new classification methods.
6. Evaluation (represents highest cognitive level)	Ability to judge and assess the value of theories and presentations, based on their value, logic or adequacy, for a given purpose; compare and make choices based on reasoned argument; verify the value of evidence; recognize subjectivity.

(Adapted from Allen and Noel, 2002; Gronlund, 2000; Palomba and Banta, 1999; Roth, Beyer, and Gillmore, 2002; Designing Valuable Assessment Plans: Evaluating Assessment Strategies, 2003; and DLRN's Technology Resource Guide, 2003)

Affective:

Affective learning is concerned with attitudes, values, interests, appreciation and feelings toward people, ideas, places and objects. Values refer to views and ideas that an individual believes in. Affective outcomes range from receiving (or willingness to participate in an activity) to adopting a value system that directs behavior.

Affective	Description
1. Accepting	Willingness to participate in an activity or to attend to a stimulus; getting and holding the attention of students.
2. Responding	Actively participates; demonstrates interest in an object, activity or phenomena; seeks or pursues this object, activity or phenomena
3. Valuing	Value or worth attached to an object, activity or phenomena; varies from simple acceptance to commitment.
4. Organization	Compare and contrast and resolve conflict to build a consistent value system; emphasis on comparing and synthesizing values.
5. Characterization by Value	Adopt a value system for a length of time that contributes to a particular "lifestyle" (i.e. directs behavior).

Skills:

The original researchers did not develop a classification method for the skills domain. Other researchers, including Harrow (1972) and Simpson (1972), provided two classification methods. The one proposed by Simpson (1972) is used in this manual to describe the psychomotor (skills) domain. The skills domain is used to classify movement patterns and behaviors.

Skill	Description
1. Perception	Uses sense organs to obtain cues to guide action; ranges from awareness of stimulus to translating cue perception into action.
2. Set	Readiness to take action; includes mental, physical and emotional set (or readiness to act).
3. Guided Response	Knowledge of the steps required to perform a task; includes imitation and trial-and-error.
4. Mechanism	Perform tasks in a habitual manner, with a degree of confidence and proficiency.
5. Complex Overt Response	Skillful performance of motor acts involving complex patterns of movement.
6. Adaptation	Skillful performance of motor acts involving complex patterns of movement; modifies movement patterns to account for problematic or new situations.
7. Origination	Creating new movement patterns to account for problematic or new situations; creates new tasks that incorporate learned ones.

(Adapted from Allen and Noel, 2002; and Gronlund, 2002).

Key words

The three domains of educational objectives were described in an earlier section. In this section, a collection of verbs is provided to help you in writing the learning outcome statements.

Of Note

You should use concrete verbs such as *define, classify, operate, formulate*, rather than passive verbs such as *be exposed to* or vague verbs such *understand, know*.

Examples of action words that are used frequently in stating learning outcome statements are provided in the table below:

Cognitive Key Words:

Knowledge	Arrange, define, describe, duplicate, enumerate, identify, indicate, know, label, list, match, memorize, name, reads, recall, recognize, record, relate, repeat, reproduce, select, state, view, underline
Comprehension	Classify, cite, convert, defend, describe, discuss, distinguish, estimate, explain, express, generalize, give examples, identify, indicate, infer, locate, paraphrase, predict, recognize, report, restate, review, rewrite, select, suggest, summarize, tell, trace, translate, understand
Application	Act, administer, apply, articulate, assess, change, chart, choose, collect, compute, construct, contribute, control, demonstrate, determine, develop, discover, dramatize, employ, establish, extend, give examples, illustrate, implement, include, inform, instruct, interpret, investigate, manipulate, operate, organize, participate, practice, predict, prepare, preserve, produce, project, provide, relate, report, schedule, shop, show, sketch, solve, teach, transfer, translate, use, utilize, write
Analysis	Analyze, appraise, breaks down, calculate, categorize, compare, contrast, correlate, criticize, debate, determine, diagram, differentiate, discriminate, distinguish, examine, experiment, focus, identify, illustrate, infer, inspect, inventory, limit, outline, point out, prioritize, question, recognize, relate, select, separate, subdivide, solve, test
Synthesis	Adapt, anticipate, arrange, assemble, categorize, collaborate, collect, combine, communicate, compile, compose, construct, create, design, devise, develop, explain, express, facilitate, formulate, generate, incorporate, individualize, initiate, integrate, intervene, manage, model, modify, negotiate, organize, perform, plan, prepare, produce, propose, rearrange, reconstruct, reinforce, relate, reorganize, revise, set up, structure, substitute, validate, write
Evaluation	Appraise, argue, assess, attach, choose, compare, conclude, contrast, criticize, critique, decide, defend, enumerate, estimate, evaluate, grade, interpret, judge, justify, measure, predict, rate, reframe, revise, score, select, support, value

Affective Key Words:

Accepting	Ask, choose, describe, follow, give, hold, identify, locate, name, point to, reply, select, use
Responding	Answer, assist, compile, conform, discuss, greet, help, label, perform, practice, present, read, recite, report, select, tell, write
Valuing	Complete, describe, differentiate, explain, follow, form, initiate, invite, join, justify, propose, read report, select, share, study, work
Organization	Adhere, alter, arrange, combine, compare complete, defend, explain, generalize, identify, integrate, modify, order, organize, prepare, relate, synthesize
Characterization by Value	Act, discriminate, display, influence, listen, modify, perform, practice, propose, qualify, question, revise, serve, solve, use, verify

Skills Key Words:

Perception	Choose, describe, detect, differentiate, distinguish, identify, isolate, relate, select, separate
Set	Begin, display, explain, move, proceed, react, respond, show, start, volunteer
Guided Response	Assemble, build, calibrate, construct, dismantle, display, dissect, fasten, fix, grind, heat, manipulate, measure, mend, mix, organize, sketch, work
Mechanism	Assemble, build, calibrate, construct, dismantle, display, dissect, fasten, fix, grind, heat, manipulate, measure, mend, mix, organize, sketch, work
Complex Overt Response	Assemble, build, calibrate, construct, dismantle, display, dissect, fasten, fix, grind, heat, manipulate, measure, mend, mix, organize, sketch, work
Adaptation	Adapt, alter, change, rearrange, reorganize, revise, vary
Origination	Arrange, combine, compose, construct, design, originate

(Adapted from Allen and Noel, 2002; Gronlund, 2000; Palomba and Banta, 1999; Roth, Beyer, and Gillmore, 2002; Designing Valuable Assessment Plans: Evaluating Assessment Strategies, 2003; and DLRN's Technology Resource Guide, 2003)