

Bloom's Taxonomy
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Benjamin Bloom created this taxonomy for categorizing level of abstraction of questions that commonly occur in educational settings. The taxonomy provides a useful structure in which to categorize test questions, since professors will characteristically ask questions within particular levels, and if you can determine the levels of questions that will appear on your exams, you will be able to study using appropriate strategies.

Competence	Skills Demonstrated
Knowledge	<ul style="list-style-type: none"> •observation and recall of information •knowledge of dates, events, places •knowledge of major ideas •mastery of subject matter •<i>Question Cues:</i> list, define, tell, describe, identify, show, label, collect, examine, tabulate, quote, name, who, when, where, etc.
Comprehension	<ul style="list-style-type: none"> •understanding information •grasp meaning •translate knowledge into new context •interpret facts, compare, contrast •order, group, infer causes •predict consequences •<i>Question Cues:</i> summarize, describe, interpret, contrast, predict, associate, distinguish, estimate, differentiate, discuss, extend
Application	<ul style="list-style-type: none"> •use information •use methods, concepts, theories in new situations •solve problems using required skills or knowledge •<i>Question Cues:</i> apply, demonstrate, calculate, complete, illustrate, show, solve, examine, modify, relate, change, classify, experiment, discover
Analysis	<ul style="list-style-type: none"> •seeing patterns •organization of parts •recognition of hidden meanings •identification of components •<i>Question Cues:</i> analyze, separate, order, explain, connect, classify, arrange, divide, compare, select, infer
Synthesis	<ul style="list-style-type: none"> •use old ideas to create new ones •generalize from given facts •relate knowledge from several areas •predict, draw conclusions •<i>Question Cues:</i> combine, integrate, modify, rearrange, substitute, plan, create, design, invent, what if?, compose, formulate, prepare, generalize, rewrite
Evaluation	<ul style="list-style-type: none"> •compare and discriminate between ideas •assess value of theories, presentations •make choices based on reasoned arguments •verify value of evidence •recognize subjectivity •<i>Question cues:</i> assess, decide, rank, grade, test, measure, recommend, convince, select, judge, explain, discriminate, support, conclude, compare, summarize

*Adapted from: Bloom, B.S. (Ed.), 1956, taxonomy of Educational Objectives: The Classification of Educational Goals, Handbook I, Cognitive Domain. New York and Toronto, Longmans, Green.

Bloom's Taxonomy

Following the 1948 Convention of the American Psychological Association, B. S. Bloom took the lead in formulating a classification of "the goals of the educational process." Three "domains" of educational activities were identified. The first of these, named the Cognitive Domain, involves knowledge and the development of intellectual attitudes and skills. (The other domains are the affective domain and the Psychomotor Domain, and need not concern us here).

Eventually, Bloom and his co-workers established a hierarchy of educational objectives, which is generally referred to as Bloom's Taxonomy, and which attempts to divide cognitive objectives into subdivisions ranging from the simplest behavior to the most complex.

It is important to realize that the divisions outlined above are not absolutes and that other systems or hierarchies have been devised. However, Bloom's taxonomy is easily understood and widely applied.

Knowledge

Knowledge is defined as the remembering of previously learned material. This may involve the recall of a wide range of material, from specific facts to complete theories, but all that is required is the bringing to mind of the appropriate information. Knowledge represents the lowest level of learning outcomes in the cognitive domain. Examples of learning objectives at this level are: know common terms, know specific facts, know methods and procedures, know basic concepts, know principles.

Comprehension

Comprehension is defined as the ability to grasp the meaning of material. This may be shown by translating material from one form to another (e.g., words to numbers), by interpreting material (explaining or summarizing), and by estimating future trends (predicting consequences or effects). These learning outcomes go one step beyond the simple remembering of material, and represent the lowest level of understanding. Examples of learning objectives at this level are: understand facts and principles, interpret verbal material, interpret charts and graphs, translate verbal material to mathematical formulas, estimate the future consequences implied in data, justify methods and procedures.

Application

Application refers to the ability to use learned material in new and concrete situations. This may include the application of such things as rules, methods, concepts, principles, laws, and theories. Learning outcomes in this area require a higher level of understanding than those under comprehension. Examples of learning objectives at this level are: apply concepts and principles to new situations, apply laws and theories to practical situations, solve mathematical problems, construct graphs and charts, demonstrate the correct usage of a method or procedure.

Analysis

Analysis refers to the ability to break down material into its component parts so that its organizational structure may be understood. This may include the identification of parts, analysis of the relationship between parts, and recognition of the organizational principles involved. Learning outcomes here represent a higher intellectual level than comprehension and application because they require an understanding of both the content and the structural form of the material. Examples of learning objectives at this level are: recognize unstated assumptions, recognize logical fallacies in reasoning, distinguish between facts and inferences, evaluate the relevancy of data, analyze the organizational structure of a work (e.g., art, music, writing)

Synthesis

Synthesis refers to the ability to put parts together to form a new whole. This may involve the production of a unique communication (theme or speech), a plan of operations (e.g., research proposal), or a set of abstract relations (scheme for classifying information). Learning outcomes in this area stress creative behaviors, with major emphasis on the formulation of new patterns or structure. Examples of learning objectives at this level are: write a well-organized theme, give a well-organized speech, write a creative short story (or poem, or musical composition), propose a plan for an experiment, integrate learning from different areas into a plan for solving a problem, formulate a new scheme for classifying objects (or events, or ideas).

Evaluation

Evaluation is concerned with the ability to judge the value of material (statement, novel, poem, research report) for a given purpose. The judgments are to be based on definite criteria. These may be internal criteria (organization), or external criteria (relevance to the purpose), and the student may determine the criteria or be given them. Learning outcomes in this area are highest in the cognitive hierarchy because they contain elements of all the other categories, plus conscious value judgments based on clearly defined criteria. Examples of learning objectives at this level are: judge the logical consistency of written material, judge the adequacy with which conclusions are supported by data, judge the value of a work (e.g., art, music, writing) by the use of internal criteria, judge the value of a work (e.g., art, music, writing) by use of external standards of excellence.

