LEVELES AND TYPES OF QUESTIONS

- Bloom's Taxonomy
- Lower and Higher Level Questions
- Open and Closed Questions

Bloom's Taxonomy

Questioning should be used purposefully to achieve well-defined goals. An instructor should ask questions which will require students to use the thinking skills which he is trying to develop. A system exists for organizing those thinking skills. Bloom's Taxonomy (Benjamin Bloom (ed.), Taxonomy of Educational Objectives: Handbook I Cognitive Domain (New York: David McKay Co., 1956)) is a hierarchial system of ordering thinking skills from lower to higher, with the higher levels including all of the cognitive skills from the lower levels.

Below are the levels of the taxonomy, a brief explanation of each one, and examples of questions which require students to use thinking skills at each level.

- Knowledge - Remembering previously learned material, e.g., definitions, concepts, principles, formulas.
  - What is the definition of "verb"?
  - What is the law of supply and demand?
  - What are the stages of cell division?

- Comprehension - Understanding the meaning of remembered material, usually demonstrated by explaining in one's own words or citing examples.
  - What are some words which are commonly used as adjectives?
  - What does the graph on page 19 mean?
  - Explain the process of digestion.

- Application - Using information in a new context to solve a problem, to answer a question, or to perform another task. The information used may be rules, principles, formulas, theories, concepts, or procedures.
  - Using the procedures we have discussed, what would you include in a summary of Bacon's essay?
  - How does the law of supply and demand explain the current increase in fruit and vegetable prices?
  - Based on your knowledge, what statistical procedure is appropriate for this problem?

- Analysis - Breaking a piece of material into its parts and explaining the relationship between the parts.
  - What are the major points that E. B. White used to develop the thesis of this essay?
  - What factors in the American economy are affecting the current price of steel?
  - What is the relationship of probability to statistical analysis?

- Synthesis - Putting parts together to form a new whole, pattern or structure.
Lower and Higher Level Questions

At times instead of referring to a specific level of the taxonomy people refer to "lower-level" and "higher-level" questions or behaviors. Lower level questions are those at the knowledge, comprehension, and simple application levels of the taxonomy. Higher-level questions are those requiring complex application (e.g., analysis, synthesis, and evaluation skills).

Usually questions at the lower levels are appropriate for:

1. evaluating students' preparation and comprehension.
2. diagnosing students' strengths and weaknesses.
3. reviewing and/or summarizing content.

Questions at higher levels of the taxonomy are usually most appropriate for:

1. encouraging students to think more deeply and critically.
2. problem solving.
3. encouraging discussions.
4. stimulating students to seek information on their own.

Typically an instructor would vary the level of questions even within a single class period. For example, an instructor might ask the synthesis question, "How can style of writing and the thesis of a given essay be related?" If she gets inadequate or incorrect student response to that question, she might move to questions at a lower level of the taxonomy to check whether students know and understand material. For example, the instructor might ask, "What is the definition of 'thesis statement'?" or "What are some variables in writing style?" If students cannot answer those questions, the instructor might have to temporarily change her teaching strategy, e.g., briefly review the material. If students can answer lower level questions, the instructor must choose a teaching strategy to help students with the more complex synthesis which the original questions requires, e.g., propose a concrete problem which can be used as a basis for moving to the more abstract synthesis. In the example used here, the teacher might direct students to Jonathan Swift's "Modest Proposal" and ask, "What is Swift's thesis?" and "What are some terms you can use to describe Swift's writing style?"

It is not essential that an instructor be able to classify each question at a specific level. The Taxonomy of Educational Objectives is introduced as a tool which is helpful for defining the kinds of thinking skills instructors expect from students and for helping to establish congruence between the instructor's goals and the questions he asks. Figure 1 provides a summary of the taxonomy and breakdown between lower and higher level questions. Another way to examine
Open and Closed Questions

In addition to asking questions at various levels of the taxonomy an instructor might consider whether he is asking closed or open questions.

A closed question is one in which there are a limited number of acceptable answers, most of which will usually be anticipated by the instructor. For example, "What is a definition for 'adjective'?" requires that students give some characteristics of adjectives and their function. While students may put the answer in their own words, correct answers will be easily judged and anticipated based on a rather limited set of characteristics and functions of adjectives.

An open question is one in which there are many acceptable answers, most of which will not be anticipated by the instructor. For example, "What is an example of an adjective?" requires only that students name "any adjective." The teacher may only judge an answer as incorrect if another part of speech or a totally unrelated answer is given. Although the specific answer may not be anticipated the instructor usually does have criteria for judging whether a particular answer is acceptable or unacceptable.

Both open and closed questions may be at any level of the taxonomy.

An open low-level question might be:

"What is an example of an adjective?"

An open high-level question might be:

"What are some ways we might solve the energy crisis?"

A closed low-level question:

"What are the stages of cell division?"

A closed high-level question:

"Given the medical data before you, would you say this patient is intoxicated or suffering from a diabetic reaction?"

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Application | Selecting a concept or skill and using it to solve a problem | Compute
Solve
Apply
Modify
Construct

HIGHER LEVEL | Analysis | Breaking material down into its parts and explaining the hierarchical relations. | How does ... apply?
Why does ... work?
How does ... relate to ...?
What distinctions can be made about ... and...?

Synthesis | Producing something original after having broken the material down into its component parts. | How does the data support ...?
How would you design an experiment which investigates...?
What predictions can you make based upon the data?

Evaluation | Making a judgment based upon a pre-established set of criteria. | What judgments can you make about ...?
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