Developing Clear Learning Outcomes and Objectives

The Design phase of a typical curriculum development process (Analysis, Design, Development, Implementation, Evaluation) is largely concerned with developing clear learning outcomes and objectives. It is important to recognize during this phase that there is a direct relationship between objectives and test questions.

Learning outcomes are broad goals that that describe *what the learners are supposed to know or be able to do* and may be based upon:

- the needs of the learner
- the needs of society
- what the learner should know about a particular subject

Because learning outcomes are broad goals, they are stated in general terms. For example, *"The learner will become familiar with the major forms and conventions of medieval literature"* or *"The learner will develop a general understanding of hydrocarbon-bearing formations"* are both reasonable learning outcomes. On their own, however, learning outcomes like these cannot be observed, measured, or evaluated. Each learning outcome, therefore, must be supported and defined by one or more specific objectives.

Objectives are the primary building blocks of good curriculum design. They support the learning outcome in that each is a small step in arriving at *what the learner is supposed to know or be able to do*. Objectives:

- define specific outcomes or competencies to be achieved in terms of skills, content mastery, attitudes, or values
- form the basis upon which to select or design instruction materials, content, or techniques
- provide the basis for determining or assessing when the instruction purpose has been accomplished
- provide a framework within which a learner can organize his efforts to complete the learning tasks

Well-written objectives are carefully worded. They include qualifiers to restrict the conditions and terms under which the objectives are met. For example:

Objective = Conditions + Performance + Criteria	
Conditions:	given "x" … without "y" …
Performance:	the learner will (verb)…
Criteria / Standards:	accuracy / quality quantity time constraints

The verbs (action words) used in objectives are also important. In order for objectives to provide a useful basis for creating test questions, they must contain verbs that describe *observable*, *measurable* actions and *specific levels of thinking*, because these are things that can be tested. (For more information about using appropriate verbs in your written objectives, refer to **Classifying Objectives** below.)

Below are three examples of well-written objectives. Each defines the special conditions that apply to the activity, the actual activity that the learner will perform, and degree of accuracy or proficiency that the learner must meet.

- **Example Objective #1:** Given a list of 10 of the largest cities in the world, without consulting a reference source, the learner will rank the cities by population, from largest to smallest, with 100% accuracy.
- **Example Objective #2:** Given a personal computer with a system disk, the learner will boot the system from a powered-down status within three minutes.

- **Example Objective #3:** Given a scenario of a community with a number of discarded tires, the learner will devise a procedure for recycling them with minimal waste, and describe the process in writing.

It would be easy to test whether a learner had achieved the objectives in these three examples, because the conditions and criteria are explicit and the verbs describe observable, measurable actions. When objectives are this clearly defined, the related test questions virtually write themselves! For example:

- **Test Question #1:** Rank the following 10 cities according to their population. (100% accuracy gets full marks)
- **Test Question #2:** Using the system disk provided, boot the system from a powered-down state. (Successful boot-up within three minutes gets full marks.)
- **Test Question #3:** Devise and describe in writing a procedure for recycling the discarded tires with minimal waste. (Full marks at instructor's discretion.)

◆ **TIP:** Keep the following guidelines in mind when you write objectives to support the learning outcomes in your modules:

- Sequence the content of each objective in a logical order, for example, from simple to complex, from known to unknown, chronologically, etc.
- Avoid the use of verbs that represent actions or concepts that are difficult to measure, such as *appreciate*, *be familiar with*, *believe*, *comprehend*, *enjoy*, *know*, *learn*, *master*, and *understand*.
- Avoid the use of vague qualifiers, such as *very*, *completely*, *fully*, *totally*, and *quickly*.

Classifying Objectives

In education environments, learning outcomes and objectives are often loosely sorted into three groups, called *domains*. These domains were identified by an educational psychologist named Benjamin Bloom, and may help you to transform your objectives into test questions more easily.

- **cognitive domain** – encompasses intellectual or thinking skills.
- **psychomotor domain** – encompasses physical skills or the performance of actions.
- **affective domain** – encompasses attitudes and values.

In each domain, Bloom identified several "levels," each with a list of suitable verbs for describing that level in written objectives. The following table describes the cognitive domain, and is based on information from Benjamin Bloom's book *Taxonomy of Educational Objectives* (1956). The levels are arranged from the least complex levels of thinking to the most complex levels of thinking.

COGNITIVE DOMAIN	
Level and Meaning:	**Use these verbs in written objectives to describe the associated cognitive level:**
Knowledge: The remembering of previously learned material (recall of facts).	define, distinguish, identify, inquire, label, list, match, memorize, name, read, recall, recognize, relate, repeat, record, select
Comprehension: The ability to grasp the meaning of the knowledge being learned.	associate, describe, differentiate, discuss, explain, extend, generalize, give examples, illustrate, infer, interpret, locate, rearrange, reorder, restate, rewrite, summarize, transform, translate
Application: The ability to use learning materials in a new way.	apply, calculate, choose, classify, demonstrate, develop, generalize, illustrate, operate, organize, practise, restructure, sketch, solve, transfer, use
Analysis: The ability to break material down into its parts so that its organizational structure may be understood.	analyze, categorize, classify, compare, contrast, deduce, describe, detect, diagram, discriminate, differentiate, distinguish, experiment, group, inspect, point out, put into lists, question, sub-divide, test
Synthesis: The ability to combine previous experiences with new material to form a whole new structure.	combine, compile, create, design, generate, integrate, modify, plan, produce, propose, solve
Evaluation: The ability to judge the value of material for a given purpose.	appraise, assess, choose, compare, conclude, consider, criticize, evaluate, judge, measure, rate, score, select, support, validate, value

In every module of learning material, a variety of cognitive levels should be represented in the objectives. To create a well-balanced learning experience, some objectives in each module should deal with *facts*, some with *concepts*, and some with the *application* of the information. Assuming that the objectives are both clearly defined and well written, this will also lead to test questions that address a variety of cognitive levels.

◆ **TIP:** As you develop your objectives, you may want to informally classify each one according to a scheme like the one described above. (You can also create your own classification scheme if Bloom's does not fit what you are trying to achieve. You will likely find that classifying your objectives as you create them will speed the process of developing test questions when the time comes.