

To make sure students get the most out of individualized learning materials, provide clear, concise instructions

Writing objectives with style

by Jesse M. Heines

Objectives have long been recognized as the backbone of individualized instructional materials. And we've all heard that these objectives should be stated in terms of overt, measurable student performances or behaviors.

But it is the measurable component of objectives that is the most difficult for instructional designers to write. If an editor takes a general objective (what Bob Mager would call a "goal") and works it into a behavioral mode, the instructional designer will often comment that the edited objective has lost the "depth" of his or her idea and no longer conveys "the true skill to be learned."

But there's another side to the coin. General objectives (Mager's "fuzzies") also do little to provide learning direction. In their course "Criterion-Referenced Instruction,"* Bob Mager and Peter Pipe introduce the concept of stating a "criterion" for each behavior so that instructors can recognize mastery performers — that is, "know one when we see one." This article deals with style in writing objectives and stating the criterion in the form of a sample test item. These test items can serve to clarify objectives and assure that they can be tested. In addition, sample test items illustrate the exact way students will be evaluated.

Over-behavioralism

Sometimes objectives are worded in such a way that the objective and sample test item would be exactly the same. In these cases, a sample test

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item is not required. Usually, however, it is better to make the objective more general to encompass a wider range of skills and then let the test item serve as an illustration of these skills. For example, here is an objective for which no sample test item is needed:

1. Match each function performed by the LQP8-E to the printed circuit board that accomplishes it.

A more generalized objective is:

2. Identify all the functions for each of the LQP8-E printed-circuit boards (PCBs) listed below.

- Power Amp PCB
- Print Wheel PCB
- Servo PCB
- Logic #1 PCB
- Logic #2 PCB
- Transducer PCB

The sample test item for this objective could be

3. Match each PCB to its functions.

Function	PCB
—decodes instructions	A. Power Amp
—outputs ready status etc.	B. Print Wheel Amp etc.

Objective 1. is an *over-behavioralized* objective. It focuses on a narrow, short-term behavior ("match") rather than a wider, more useful behavior ("identify functions"). Here's another objective that carries the over-behavioralization problem to the limit:

4. Correctly answer 8 out of 10 questions on the major VS-60 components, features and options.

"Answering questions" is not a real objective of any training course I've ever observed. This behavior is merely an indicator of more complex mental processes. The true objective is closer to:

5. Identify the functions and uses of the CRT

display monitor, display processor unit and light pen in the VS-60 Graphics Display Subsystem. You must respond correctly to 8 out of 10 multiple-choice test items on these units to demonstrate mastery.

The second sentence states the objective's criterion. A sample test item for this objective might be:

6. The device that is used to select and manipulate displayed graphic information on the VS-60 is the

- A. central processing unit.
- B. CRT display monitor.
- C. display processor unit.
- D. light pen.

One more point about Objective 4. In most cases, it's not necessary to instruct students to do things "correctly," because it would be ridiculous for them to strive to do things "incorrectly." The term may make sense in Objective 4. because it's possible to answer ten questions and not get eight of them correct. It would not, however, add anything to Item 3. to instruct students to "correctly match each PCB to its functions."

Wordiness

Wordiness is another problem area in objective and test-item writing. I have three suggestions to make in this area.

The first suggestion concerns the phrase "the student will be able to." In general, this phrase should be avoided because it is simply verbiage. Rather, objectives should be written in the second person with the subject "you" understood. Here is an example:

7. Given a block diagram of an LQP8-E, the student will be able to label the interface signals without references.

A simpler statement is:

8. Given a block diagram of an LQP8-E,

*Mager Associates, Inc., 151 University Ave., Suite 400, Palo Alto, CA 94301./1/1

label the interface signals without references.

An exception to this style involves objectives that are too large or complex to be tested completely. In these cases, you want students to "be able to" do all the tasks listed, but they will be tested on only a "sample" of them. Here is an example:

9. Given an LQP8-E line printer, be able to remove and re-install the field replaceable units (FRUs). You will be asked to remove and re-install two of the FRUs listed below.
- Power amp PCB
 - Carriage amp PCB
 - Carriage assembly
 - Shaft carriage
 - Hammer armature assembly
 - Magnetic pick-up
 - Rear carriage bearing
 - Ribbon lift assembly
 - Ribbon lift coil assembly
 - Bail arm (right/left)

Look at the criterion for this objective. It would be too time-consuming to test each student on all 10 of these FRUs. Also, it is probably safe to assume that if a student can replace two or three of these units (a "sample" of the skills), he or she can replace them all. By using a random sample of these FRUs as the test, each student would have to be sure that he or she could replace them all before asking for the test. To guarantee this completely, a different sample should be used for

each student. The sample test item for Objective 9. might be:

10. Your instructor will pick two of the FRUs listed in the objective. Remove and re-install the designated parts.

The second suggestion problem concerns long lists of "givens" and starting all or most objectives with the word "given." The first can confuse the reader, while the second can bore him. Look at this objective:

11. Given all necessary tools, test equipment, diagnostics and documentation, perform all necessary adjustments on a functioning, but maladjusted, VS-60.

The "givens" in this objective make it difficult to read because they don't mean anything to the reader until he or she gets to the action, "perform all necessary adjustments." It would be better to break this objective into two sentences with the action stated first. This approach will also allow elimination of the word "given."

12. Perform all necessary adjustments on a functioning, but maladjusted, VS-60. You will be supplied with all necessary tools, test equipment, diagnostics and documentation.

Just as the preceding problems are usually caused by trying to crowd an entire objective into one sentence, you can also cause unnecessary confusion by trying to crowd too many goals into one objective. There is no reason why a

goal cannot give birth to two, three or even more objectives as long as they're related. This strategy can often make objectives clearer and allow ideas to be more fully developed.

Finally, be careful that objectives and sample test items don't get bogged down with phrases such as "without references" or "using the XYZ manual." This information can be "factored out" of objectives and placed in a Student Guide. That is, if most tests will be "open book" and allow references, say so in the Student Guide: Unless otherwise noted, you may use any references when taking a test except another person. Thus, you need only specify when references are *not* allowed.

Writing with style

A training organization cannot expect every instructional designer to write in the same style, but it can strive to make its materials look uniform. Such uniformity, especially when standardized in a clear writing style, can assist students by making it easy to move from prerequisite to higher-level courses. An unencumbered style will assure that students "get the message" and that objectives provide clear learning direction. ■