

Writing Learning Objectives: Beginning With The End In Mind



Learning Objectives

Participants will be able to:

- Compare and contrast learning objectives vs. learning goals.
- List the 3 parts of the “ideal” learning objective.
- Write learning objectives that contain a measurable verb and communicate clearly to the student.
- Develop learning objectives which demonstrate Bloom’s higher levels of thinking.

Some History

Objectives are statements which describe what the learner is expected to achieve as a result of instruction.

Because they direct attention to the student and the types of behaviors they should exhibit, sometimes these statements are called “behavioral” objectives.

Some other names you will see for behavioral objectives include:

- Learning objectives
- Outcomes
- Enabling objectives
- Terminal objectives
- Educational objectives
- Performance objectives
- Instructional objectives
- Aims
- Competencies

History

- Objectives were conceptualized and used during WWII as a way to make teaching and learning more efficient.
- In the late 1950s and in the 1960s this approach was applied to the public schools.
- By the 1960s health professions schools were developing behavioral objectives.
- 1962 = publication of Preparing Instructional Objectives by Robert F. Mager

The point here is that learning objectives have been around a long time. Robert Mager can probably be credited with launching the move toward the broad based movement to utilize learning objectives. Ironically, the title of his book added to some confusion regarding learning objectives. Some people looked at the title and concluded that objectives referred to what the teacher would do as opposed to what the learner would do. Mager's book was printed as a second edition in 1975.

Goals

- **Definition**
 - A statement that describes in broad terms what the learner will gain from instruction
- **Example**
 - Students will gain an appreciation of the role of the family medicine physician in the health care system

The terms “goals” and “objectives” are sometimes used interchangeably. This is wrong. They are different. Goals are broad and sometimes difficult to directly measure. The important thing about goals is that they help us focus on the big and important picture. I am sure that everyone in family medicine would agree that the goal stated on the slide above is important and something we want the students to gain. From this goal one could write a set of related and specific learning objectives.

Learning Objective

- **Definition**
 - A statement in specific and measurable terms that describes what the learner will know or be able to do as a result of engaging in a learning activity.
- **Example**
 - Students will list three characteristics that make the family medicine physician distinctive from other specialists in the health care system.

A learning objective or behavioral objective, if you prefer, is much more specific than a goal. According to Mager, the ideal learning objective has 3 parts:

1. A measurable verb
2. The important condition (if any) under which the performance is to occur and
3. The criterion of acceptable performance.

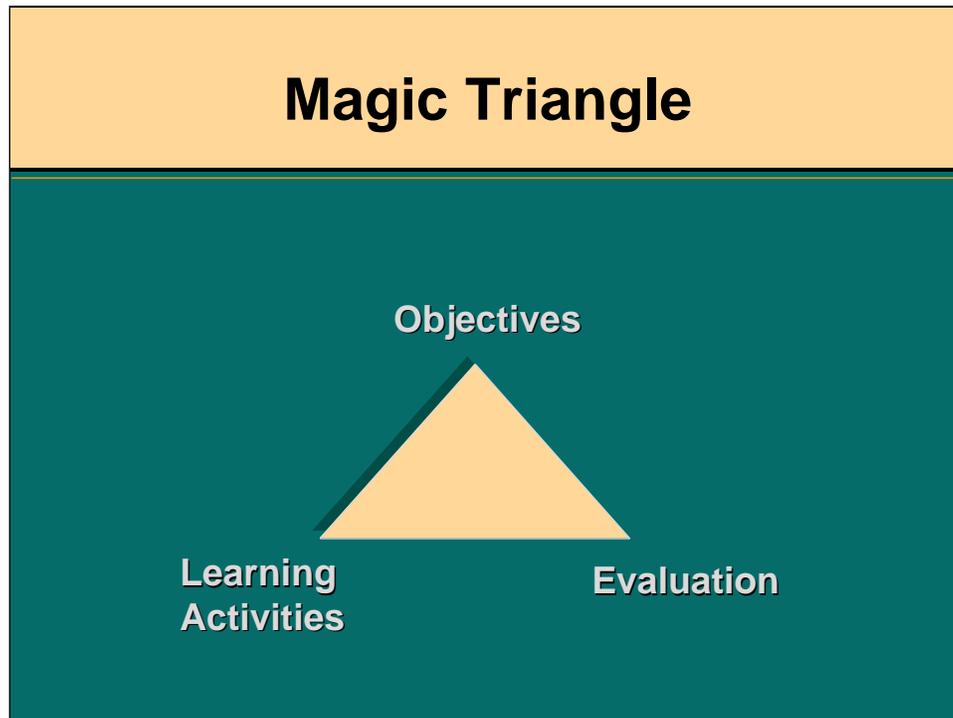
Frequently you will not see the criterion or the condition specified if they are obvious. However, sometimes the adding the condition(s) and/or the criterion add much clarity to a learning objective.

Purposes of Objectives

- **Purposes of Objectives**
 - By knowing where you intend to go, you increase the chances of you and the learner ending up there
 - Guides the teacher relative to the planning of instruction, delivery of instruction and evaluation of student achievement.
 - Guides the learner; helps him/her focus and set priorities
 - Allows for analysis in terms of the levels of teaching and learning

Additional purposes of objectives include:

- Shows colleagues and students what we value.
- Guide for the learner relative to self-assessment.
- Basis for analyzing the level of cognitive thinking we are expecting from the learner.
- Makes teaching more focused and organized.
- Provides models so that the students can write their own objectives and thus helps develop an important life long learning skill; “the setting of objectives.”



This triangle represents the relationship between learning objectives, learning activities and evaluation. If these three components are congruent then teaching and learning is enhanced, hence, "The Magic Triangle." If these three components are not congruent then students become discouraged and unhappy and make the assumption the objectives cannot be trusted and they will stop paying attention to them. Note: learning activities are those things the student does to learn and hopefully the learning activities are somewhat planned by the teacher. For example, listening to a lecture would be a learning activity; as would engaging in a small group discussion led by a facilitator; as would making rounds with a clinician, etc. Evaluation is usually thought of as the test but evaluation could also be an assignment that is graded such as a project. The important thing is that whatever form the evaluation takes, the evaluation should measure the student's accomplishment of the learning objectives.

Learning Objective Domains

- Cognitive (knowing)
- Psychomotor (doing)
- Affective (feeling)

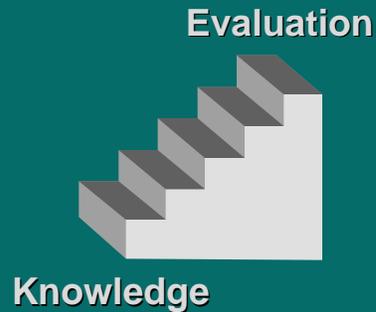
Statements of affective outcomes include:
“show sensitivity to” ... “accept
responsibility for” “be willing to”
“demonstrate commitment to”

There are really 3 domains or categories of learning objectives. In medical school the cognitive objectives are the ones that we normally think about. Psychomotor objectives are also stated but many times they are stated in vague terms and they could be made much clearer if the criterion were included as part of the objectives. However, we rarely see objectives in the affective domain. This does not mean we don't value the affective domain. In fact some would argue that it is the most important domain. It is just that objectives in the affective domain are a little hard to write and they are really hard to measure and usually that measurement involves a lot of subjectivity. Affective objectives will be the topic for another slide show.

Levels of Objectives

- **Bloom's Taxonomy**

- Knowledge
- Comprehension
- Application
- Analysis
- Synthesis
- Evaluation



Benjamin Bloom's taxonomy has been around since the mid to late 50's. His taxonomy of cognitive behavior provides a nice stair-step approach to thinking about levels of learning. The knowledge level refers to the level of memorization and regurgitation. Unfortunately, Research shows that this is the level at which a lot of medical school education is focused. For a more complete explanation of Bloom's taxonomy visit the following site:

<http://a41064.west.asu.edu/students/dfields/96-598/b.bloom.html>

Levels of Objectives

- Name and describe the components of the Kemp Model.
- Utilize components of the Kemp Model to design an instructional sequence.

The purpose of this slide is to have you compare and contract the two stated learning objectives relative to their level in Bloom's taxonomy. As an aside, the Kemp Model is an instructional design model and one component of that model happens to be "learning objectives." To learn more about the Kemp Model click [here](#).

Please note that the first learning objective can be placed in the "knowledge" level of Bloom's taxonomy. Alternatively, the second objective is certainly at a higher level than "knowledge" because it requires the learner to apply his/her knowledge and understanding of the Kemp Model to design instruction. One could argue the exact level of Bloom's taxonomy it addresses but we can all agree that it is about the knowledge level.

Levels of Objectives

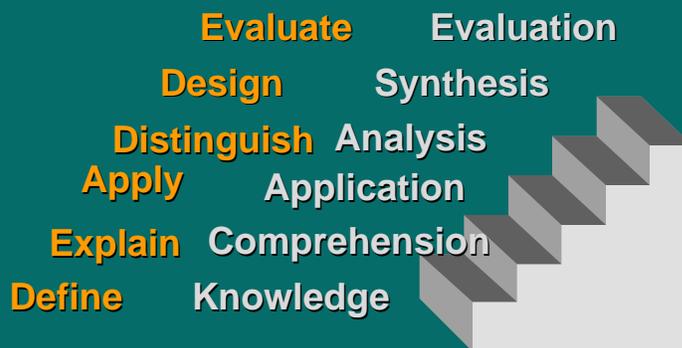
- Name the five causes of dizziness.
- Given a patient case description, determine the three most likely causes of dizziness.



Here are two more examples of learning objectives at different levels. Which level of Bloom's taxonomy is the first one? What level is the second one?

Which of these two objectives requires the more thought and effort relative to writing a test question? I'll bet you know the answer, and this partially explains why we see so many low level objectives and low level questions on medical school exams.

Relating the Measurable Verb to Bloom's Levels



On the next few slides you will see some examples of measurable verbs (examples in orange on this slide) that correspond to particular levels of Bloom's taxonomy. I would argue that you can't always determine the level of cognitive level of an objective just based on the measurable verb - but - having such a set of verbs can be helpful and in some cases do point to the cognitive level.

Knowledge Verbs (1st level)

- **Define**
- **Memorize**
- **List**
- **Recall**
- **Repeat**
- **Relate**
- **Name**
- **Repeat**

Comprehension Verbs (2nd level)

- **Restate**
- **Discuss**
- **Describe**
- **Identify**
- **Locate**
- **Report**
- **Explain**
- **Express**
- **Recognize**
- **Review**

Application Verbs (3rd level)

- **Translate**
- **Interpret**
- **Apply**
- **Practice**
- **Illustrate**
- **Operate**
- **Demonstrate**
- **Dramatize**
- **Sketch**
- **Employ**
- **Schedule**
- **Use**

Analysis Verbs (4th level)

- **Distinguish**
- **Differentiate**
- **Appraise**
- **Analyze**
- **Calculate**
- **Criticize**
- **Compare**
- **Contrast**
- **Examine**
- **Test**
- **Relate**
- **Experiment**

Synthesis Verbs (5th level)

- **Compose**
- **Plan**
- **Propose**
- **Design**
- **Assemble**
- **Create**
- **Prepare**
- **Formulate**
- **Organize**
- **Manage**
- **Construct**
- **Set-up**

Evaluation Verbs (6th level)

- Judge
- Appraise
- Evaluate
- Revise
- Score
- Select
- Measure
- Value
- Estimate
- Choose
- Compute
- Assess

The Evolution of An Objective

Original Objective:

Using Fick's Law for Diffusion, contrast the movement of oxygen and glucose from the plasma to the intracellular space. Based on their chemical properties, predict which of these substances would show diffusion limited movement, and which would show flow limited movement.

The next few slides show the evolutionary development of an objective using input from a group that worked on developing a set of learning objectives for physiology. Basically the strategy was as follows. (1) An individual faculty member writes the first draft of the objective. (2) He/She explains the intent of the objective to a group. (3) The group responds with suggestions. (4) The objective is rewritten.

You can see more examples at the following web site:

<http://www.physiol.med.ecu.edu/objectiv/template.htm>

This particular site is from a medical physiology objectives project and has a lot of good information about writing objectives and some great examples.

The Evolution of an Objective

The author's statement of intent:

I expect the students to review the factors influencing diffusion (presented earlier in the course), and contrast the movement of two different agents from the blood to the cell. I also expect a working definition of flow limited and diffusion limited transport.

The Evolution of an Objective

What the committee said:

Glucose movement is tissue specific, and entry into the cell by any of a variety of glucose transporters further obscures my intent (transport from the blood to the cell. Identify a tissue, and delete intracellular space. Finally transport is a poorly defined term, replace with exchange (the term used in the text)

The Evolution of an Objective

Final revised version:

Using Fick's Law for Diffusion, contrast the movement of oxygen and glucose from the plasma to a skeletal muscle cell. Based on their chemical properties, predict which of these substances would show diffusion limited exchange, and which would show flow limited exchange.

How Could This Objective Be Improved?

- **The resident will demonstrate the ability to make empathic responses to patient statements that reflect particular emotions such as anger, sadness, concern, etc.**

Most objectives can be improved by systematically considering the three parts of an “ideal” objective according to Mager. So first look at the verb. In the objective above, the verb “demonstrate” is probably OK. It certainly implies that someone is going to have to observe the resident with a real or simulated patient as the resident responds. The observation could be done as the resident “demonstrates” in a role play situation. One could conclude that perhaps we need to clarify the context in which the resident will be demonstrating these empathic responses. So maybe we need to make this clear by giving what Mager would call the “conditions.” For this situation we will say the conditions are “with a simulated patient.” Another way we can add clarity is to specify what particular emphatic responses we are referring to and in what order these responses need to be made. So, in effect, these specific responses made in a certain sequence becomes the “criteria.” The improved objective can be seen on the next slide.

How Could This Objective Be Improved?

- During an encounter with a simulated patient, the resident will demonstrate the ability to make empathic responses to patient statements that reflect particular emotions such as anger, sadness, concern, etc. The following specific empathic responses in the following sequence should be demonstrated.
 - 1. Reflective statement
 - 2.
 - 3.
 - 4.

Most objectives can be improved by systematically considering the three parts of an “ideal” objective according to Mager. So first look at the verb. In the objective above, the verb “demonstrate” is probably OK. It certainly implies that someone is going to have to observe the resident with a real or simulated patient as the resident responds. The observation could be done as the resident “demonstrates” in a role play situation. One could conclude that perhaps we need to clarify the context in which the resident will be demonstrating these empathic responses. So maybe we need to make this clear by giving what Mager would call the “conditions.” For this situation we will say the conditions are “with a simulated patient.” Another way we can add clarity is to specify what particular emphatic responses we are referring to and in what order these responses need to be made. So, in effect, these specific responses made in a certain sequence becomes the “criteria.” The improved objective can be seen on the next slide.

Effective Learning Objectives

- Consistent with the goals of the curriculum
- Clearly stated
- Clearly measurable
- Realistic and doable
- Appropriate for the level of the learner
- Worthy (Important stuff)

The characteristics of effective objectives as stated above provide us with some criteria to evaluate objectives you construct.

Some Examples of Some Pretty Good Objectives?

- The learner will be able to: orally present a new patient's case in a logical manner, chronologically developing the present illness, summarizing the pertinent positive & negatives findings as well as the differential & plans for further testing & management.
- The learner will be able to: describe the mechanisms of action for each of the two classes of neuromuscular blocking agents (depolarizing agents & competitive agents)

Some Examples of Some Pretty Good Objectives?

- The learner will be able to: describe suppurative arthritis. Include the usual pathways of joint infection, most common organisms, clinical manifestations, including lab diagnosis and the natural history.
- Given a ventriclogram and cath lab data of pressures, cardiac outputs and ejection fraction, identify the states of normal hearts, aortic stenosis and mitral regulation.

Some Examples of Some Pretty Good Objectives?

- Given a case problem, including history, physical findings, diagnosis, and list of prescribed drugs, state the physiologic, pathophysiologic and pharmacologic factors that could modify the drug response in that patient.
- Given the calculated results of tests compared with predicted normal values, determine the presence or absence of abnormal pulmonary function and classify it as to type and severity.

The End

Good luck in your efforts to write clear and measurable objectives that communicate well to learners and colleagues.