



INDIANA UNIVERSITY

DIVISION OF CONTINUING MEDICAL EDUCATION
School of Medicine

Writing Measurable Educational Objectives

Establishing educational objectives is one of the most important steps in planning a CME activity, as they lay the foundation for what participants are expected to do, know or value as a result of the educational experience. Objectives are the critical link between gaps and outcomes. Objectives guide the choice of content, the educational format and methodologies, and the methods for evaluation.

Formulation of Objectives

Learning objectives are developed following the needs analysis. The translation of the results of the needs assessment into educational objectives is done by determining if the need would be filled by a change in physician knowledge, attitude or skill. Next is to decide what level of change can be achieved by the learning activity. For example, if the need is to learn about a new breakthrough in medical technology, the level of change in knowledge may go from fact to comprehension in a short course that describes how the new technology relates to practice. In longer programs or a series of courses, knowledge may change several levels from fact to application, synthesis, or appraisal.

Objectives must be specific, measurable and bridge the gap between the identified need and desired result. The type of gap determines the content of the objective. Three essential components to writing an effective learning objective are *who* (the learner), *how* (an action verb) and *what* (the result):

| Component | Definition | Example |
|-------------|----------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| WHO | Participants, learners, physicians, and healthcare providers | Participants should be able |
| HOW | An action verb that identifies the level of performance | to integrate |
| WHAT | A description of the relevant factors associated with the desired result that specifies what learning will be demonstrated | the key components of a successful smoking cessation program in a busy primary care practice |

A well known and well understood method for setting objectives is the S.M.A.R.T. way. S.M.A.R.T refers to the acronym that describes the key characteristics of meaningful objectives, which are:

- **S**pecific (concrete, detailed, well defined)
- **M**easurable (numbers, quantity, comparison)
- **A**chievable (feasible, actionable)
- **R**ealistic (considering resources)
- **T**ime-Bound (a defined time line)

In CME, learning objectives are written in terms of what the physician will apply to his/her practice environment. They are written so that there is a change expected (C3) and a link:

- between the content and what the learner is presently doing or may do in his current practice (C4)
- from objectives to the content (C5)
- from objectives to measurable content (C3 and C11)
- to the selection of faculty with expertise to address them

All CME activities are expected to change physician competence, performance or patient outcomes, as opposed to merely increasing knowledge. Therefore, learning objectives need to be focused on higher level outcomes.

Verbs that relate to specific actions or behaviors are critical to writing objectives. Some verbs are better choices for some objectives than others. Verbs that relate to specific actions or behaviors are critical. Avoid use of verbs such as *know*, *learn*, *increase*, *understand*, *appreciate*, *improve*, and *become* because they are not action oriented (behavioral) and therefore not measurable. Examples of action verbs useful for generating outcomes are listed below by domain:

| Behavioral Verbs: Cognitive (Thinking) | | | | | |
|-----------------------------------------------|-----------------------------|---------------------------|------------------------|-------------------------|--------------------------|
| <i>Knowledge</i> | <i>Comprehension</i> | <i>Application</i> | <i>Analysis</i> | <i>Synthesis</i> | <i>Evaluation</i> |
| Define | Discuss | Compute | Distinguish | Diagnose | Evaluate |
| List | Describe | Demonstrate | Analyze | Propose | Assess |
| Recall | Explain | Illustrate | Compare | Design | Justify |
| Name | Identify | Perform | Contrast | Manage | Judge |
| Recognize | Translate | Interpret | Categorize | Summarize | Rate |
| State | Restate | Apply | Appraise | Plan | Choose |
| Repeat | Express | Use | Classify | Formulate | Decide |
| Record | Convert | Practice | Outline | Arrange | |
| Label | Estimate | Predict | Differentiate | Organize | |

Knowledge and *Comprehension* encompass cognitive processes of remembering or explaining. This is the lowest level on the cognitive pyramid. *Application* and *Analysis* are at a higher level and involve using knowledge to find new solutions, or in breaking a whole into component parts. *Synthesis* and *Evaluation* are problem solving cognitive processes, usually involving the creation of a new whole, or ability to judge the value of some thing(s). *Synthesis* and *Evaluation* are at the highest level. When and where possible, use higher level verbs which are more conducive to writing objectives that improve competence, performance and/or improve patient outcomes.

Most CME activities will be written in the cognitive domain. The other two domains are:

| Behavioral Verbs: Affective (Attitudinal) | | | | |
|--------------------------------------------------|--------------------------|-----------------------|----------------------------|--------------------------------|
| <i>Receiving</i> | <i>Responding</i> | <i>Valuing</i> | <i>Organization</i> | <i>Characterization</i> |
| Accept | Answer | Adopt | Collaborate | Act |
| Acknowledge | Attempt | Foster | Consult | Advocate |
| Follow | Read | Join | Organize | Debate |
| Observe | Report | Share | Plan | Influence |

| Behavioral Verbs: Psychomotor (Doing) | | | | | | |
|----------------------------------------------|-------------------|-------------------------------|-------------------------|--------------------------------|--------------------------|---------------------------|
| <i>Perception</i> | <i>Set</i> | <i>Guided Response</i> | <i>Mechanism</i> | <i>Complex Response</i> | <i>Adaptation</i> | <i>Origination</i> |
| Describe | Begin | Copy | Display | Display | Adapt | Arrange |
| Detect | React | Follow | Manipulate | Manipulate | Change | Create |
| Differentiate | Start | Reproduce | Operate | Operate | Revise | Compose |
| Identify | State | Respond | Perform | Perform | Vary | Initiate |

Target Your Audience

Before writing objectives, it is helpful to ask a few questions of those involved in planning the activity. Ideally, these questions have been answered in a well-designed needs assessment:

- What course of action, outcome, or change does the needs assessment indicate is necessary?
- What information can presenters share to enhance the intended audience's understanding and competency?
- What do you want the participants to take away from this activity?

Consider the following when developing objectives for a target population:

- Participants' current level of knowledge
- Participants' background experiences in the subject-matter area
- Participants' general attitude toward the instructional content, and
- Participants' preferences for instructional format and media.

Types of Learning Objectives

The following example illustrates the various levels that an objective can be written in the cognitive domain, beginning with the lowest level and advancing to the highest:

- Knowledge
Example: List the key components of an effective smoking cessation program applicable to a primary care practice
- Comprehension
Example: Describe each component of an effective smoking cessation program applicable to a primary care practice
- Application
Example: Illustrate how key components of an effective smoking cessation program can be applied effectively in primary care settings
- Analysis
Example: Analyze the effectiveness of each component of an effective smoking cessation program and explain why a well designed program may be effective in a primary care setting
- Synthesis
Example: Design an individualized smoking cessation plan based on the patient's motivation and medical history
- Evaluation
Example: Assess the effectiveness of your own smoking cessation program and determine the reasons for success or failure

In CME, objectives must address physician competence, performance or patient outcomes. Examples of learning objectives that are written specifically to address these levels might include:

- Improvement in Competency
Knowing how to do something: What a physician would do if given the opportunity but has not been put into practice yet
Example: Describe the factors involved in developing cultural competence and how to address these clinically.
- Enhanced Performance
The ability to apply knowledge, skills, and judgments in practice
Example: Implement strategies that address cultural competence (specifically linguistic, cultural and social issues that affect mental health and mental health care in the Latino community) in clinical practice.
- Change in Patient Outcomes
The consequences of performance that have direct and positive results for patients

Example: Reduce morbidity and mortality rates of the Latino population by addressing linguistic, cultural and social issues that affect mental health and mental health care of this community.

More Examples of Objectives

Upon completion of this learning activity, learners will be able to evaluate non-Hodgkins lymphoma therapies for applicability to post menopausal women so that symptom control from HRT is not compromised.

Following this study module, learners will be able to determine which of the geriatric patients will benefit from flu vaccine based on their co-morbidities.

At the conclusion of this course, the participant should be able to calculate the amount of AIV fluid necessary to replenish a dehydrated patient.

As a result of this conference, participants will be able to evaluate available efficacy and safety data on new and emerging smoking cessation therapies to determine how they may be integrated into treatment.

By the end of this course, the physician will be able to assess relevant clinical features of angina with pertinent differential diagnosis.

After completing this activity, learners will be able to apply the latest advances in pain management to ameliorate the suffering of patients in end stage cancer.

At the conclusion of this program, participants should be able to construct a disease management strategy for patients with type 2 diabetes selecting from models proven to reduce hospitalizations.

At the conclusion of this activity, learners should be able to apply the principles of evidence-based medicine and cost effectiveness in making decisions about the utilization of limited medical resources for patients in need of lung transplant.

Further Reading

Writing Learning Objectives: Beginning With the End in Mind
<http://www.oucom.ohiou.edu/fd/Writing%20Learning%20Objectives.pdf>

Mager RF. *Preparing Instructional Objectives 2nd Ed.* Belmont, CA: Lake Publishing Company, 1984.

Writing Instructional Objectives: http://meded.ucsd.edu/faculty/writing_instructional_objectives.pdf