Introduction to Writing Learning Objectives

I. **Why?**
- When writing learning objectives, the educator selects content, develops a goal-oriented instructional approach or strategy, and creates a mechanism to assess learner performance and instructional effectiveness.
- Learning objectives set expectations and guidance for learners and assist them to focus upon key concepts in preparation for performance assessment and set standards by which learning will be evaluated.
- Learning objectives help to engage learners through improved attention and resultant optimal academic and/or clinical performance.
- Learning objectives foster common understanding between learners and educators about what an activity/ unit of instruction should accomplish.

II. **Definitions**
- Learning Goals: provide general broad statement of overall purpose of instruction; these are sometimes used in error as learning objectives and should be avoided.
- Learning Objectives: provide clear, specific, measurable statements of learner performance and/or behavior that will be assessed and used to determine if desired instructional outcomes have been met, i.e., if the learner has achieved the desired level of quantifiable observable knowledge, skill, attitudes and behaviors. (Focus on what the learner will do, to what level of performance and by what time that will occur). Learning objectives have two main parts: performance (what the learner is expected to do in order to demonstrate content/ skill mastery) and criterion (what the minimum acceptable level of knowledge and/or skill proficiency will be in order to achieve the objective). ***In short, learning objectives should clearly describe what learners should be able to do upon completing an activity. They should be learner-centered, performance-based, outcome-focused and define a required level of mastery.***
- In Bloom's Taxonomy of Educational Objectives, there are six main categories/ domains of cognition, from least to most complex (lower to higher order), that apply to learning objectives.
    1. Knowledge: involves simple factual recall of terms, basic concepts, and definitions, without correlation or application, by the learner.
    2. Comprehension/Understanding: the learner must comprehend/ understand information and be able to explain or interpret its meaning.
    3. Application: The learner must be able to use new basic knowledge or principles to solve a problem, review/ select and use data to complete a task, all with minimal assistance/ guidance.
    4. Analysis: involves the ability to break material into its smaller parts and determine how they are similar or different.
    5. Synthesis: requires learners to integrate and create new concepts and conclusions from what is known.
    6. Evaluation: learners must assess and critically analyze content, resulting in conclusions made.

III.   To write effective learning objectives, one must strive to:

A) Focus on learners' expected level of performance, considering what will be observed, learned, and measured and to what degree of knowledge, skill performance and with what behavioral ability or attitude.
B) Consider overall objectives of the content presented and ensure specific objectives are reasonable and related to learner evaluation.
C) Use active/action verbs with specific correlations and expectations.

D) Consider the main learning domains:
   i) <u>cognitive</u>: knowing what knowledge will be acquired and to what degree.
   ii) <u>affective (feeling)</u>: what values (attitudes) will be addressed.
   iii) <u>psychomotor (doing)</u>: what skills will be performed and to what degree of proficiency.
E) Incorporate time frames into learning objectives (example: "By the end of the presentation/ rotation, the learner will be able to…").

IV. Relevant action words/ verbs for each level in Bloom's Taxonomy might include:
   1. <u>Knowledge:</u> define, describe, state, recall, list, identify, outline, select, etc.
   2. <u>Comprehension:</u> explain, classify, indicate, discuss, distinguish, summarize, give examples, indicate, etc.
   3. <u>Application:</u> demonstrate, apply, predict, construct, calculate, write, interpret, perform, etc.
   4. <u>Analysis:</u> analyze, categorize, compare/ contrast, estimate, produce/ prepare, etc.
   5. <u>Synthesis:</u> develop, derive, arrange, construct, design, plan, revise, categorize, etc.
   6. <u>Evaluation:</u> justify, assess, appraise, discriminate, summarize, choose, etc.

   ==*Some words to avoid: "know, realize, study, comprehend, appropriate, gain knowledge/skills, and be aware of, acquainted or familiar with."*==

V. <u>Sample objectives</u>
   - <u>Knowledge:</u> The learner will list the six levels of Bloom's Taxonomy of the cognitive domain.
   - <u>Comprehension:</u> The learner will explain why fibrin degradation products are elevated in disseminated intravascular coagulation.
   - <u>Application:</u> The learner will write a complete time-framed learning objective for each level of Bloom's Taxonomy.
   - <u>Analysis:</u> The learner will be able to compare and contrast the cognitive and affective learning domains.
   - <u>Synthesis:</u> The learner will design a classification method for writing learning objectives that incorporate cognitive, affective, and psychomotor learning domains.
   - <u>Evaluation:</u> The learner will assess the effectiveness, from the standpoint of long-term outcome data, of writing objectives using Bloom's Taxonomy.

   Other examples:
   - Students will be able to correctly assess alcohol abuse by using CAGE questions for one simulated and one actual patient in observed or simulated encounters.
   - Using necessary equipment, students will be able to intubate with minimal patient discomfort or injury.

VI. **Potential Pitfalls in Writing Learning Objectives**
   A. Creating goals (which are broad, general, non-specific usually not measurable statements about what should be learned and that can't be objectively verified/ confirmed and do not describe outcomes of learning.
   B. ==*Use of vague, non-measurable, words such as "understand," "appreciate," "value," etc.*==
   C. <u>False objectives</u>- That do not contain a reference to specific performance, for example: Learners will have an understanding of biostatistics that is useful in primary care practice.
   D. <u>Practice activities</u>- These describe activities rather than instructional outcomes. <u>Example:</u> Learners will be able to discuss patients' case histories and presentations.
   E. <u>Instructor/ Preceptor Performance Statements:</u> These describe what the instructor/ preceptor, rather than the learner, will do. <u>Example:</u> the preceptor/ instructor will assist learners to recognize the features of congestive heart failure, or, "introduce students to the basic principles of pain management."
   F. <u>False criteria:</u> Objectives that do not contain standards of learner performance. <u>Example:</u> learners will show how to satisfactorily conduct a patient interview.

VII. **Summary of Key Points**

1. Learning objectives are an essential component in medical education at all levels that actively engage learners, allow assessment of clearly stated outcomes, and help determine the success and effectiveness of instruction, regardless of setting.
2. Learning objectives set measurable standards of performance for learners.
3. Learning objectives must be written using appropriate action verbs, be specific and concise and be objectively measurable.
4. Learning objectives should engage learners in all levels of Bloom's Taxonomy, with emphasis upon application, analysis, synthesis, and evaluation, which require prerequisite adequate knowledge and comprehension.
5. Learning objectives should focus on the learner, not the educator, and should allow progressively more sophisticated subject knowledge and mastery.
6. Learning objectives should be formulated with the end goal in mind.

References:

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C. Bloom, B.S. (Ed.) Taxonomy of educational objectives: the classification of educational goals: Handbook I, N.Y./ Toronto: Longmans, Green (1956)
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F. Mager, RF. Preparing instructional objectives. Lake Publishing Co, Belmont, CA. (1984)

Writing Clear Learning Objectives

A clear learning objective states what the learner will be able to do upon completion of a continuing medical education activity, in terms of behavioral change. A clear objective identifies the terminal behavior or desired outcome of the educational offering.

When writing objectives, follow these 3 steps:

Step 1
Learning objectives begin with the phrase:
> "At the conclusion of this activity, participants will be able to…"

Step 2
Connect step one with an action verb which communicates the performance by the learner. Use verbs which describe an action that can be observed and that are measurable within the teaching time frame (e.g., via a post-test).

Sample verbs

Knowledge	Comprehension	Application	Analysis	Synthesis	Evaluation
define	classify	apply	analyze	arrange	assess
identify	compile	calculate	calculate	assemble	compare
label	conclude	demonstrate	categorize	compose	critique
list	discuss	develop	classify	construct	decide
match	describe	interpret	criticize	design	determine
name	explain	locate	compare	develop	establish
recall	express	operate	contrast	diagnose	evaluate
recognize	give examples	perform	determine	manage	judge
record	identify	practice	differentiate	organize	justify
relate	interpret	predict	distinguish	plan	measure
repeat	recognize	present	examine	propose	rate
select	summarize	report	outline	relate	recommend
state	translate	use	test	summarize	select

Step 3
Conclude with the specifics of what the learner will be doing when demonstrating achievement or mastery of the objectives. Stress what the participant will walk away from the activity with.

Words to Avoid

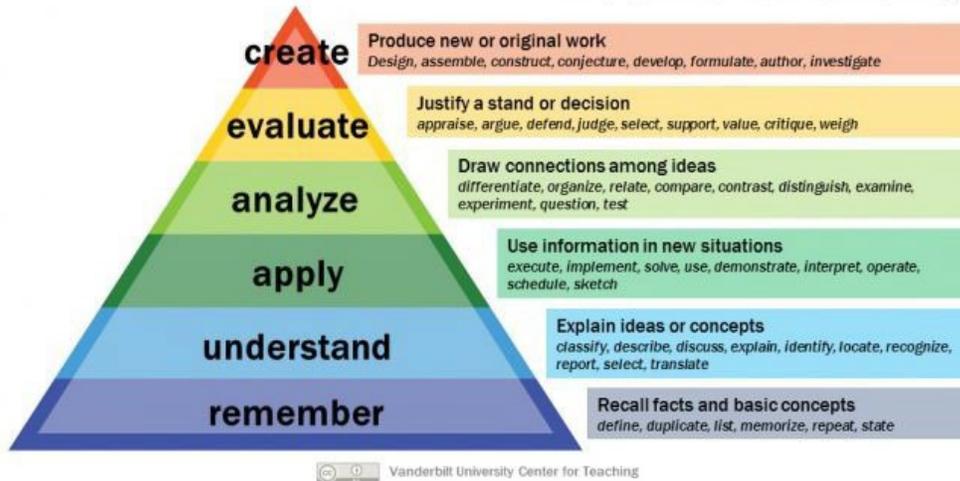|			
appreciate	believe	improve	learn
approach	grasp the significance of	increase	thinks critically
become	grow	know	understand

References
Marshall University Joan C. Edwards School of Medicine, Continuing Medical Education
Northeastern Ohio Universities College of Medicine, Continuing Medical Education Program

Bloom's Taxonomy

by Patricia Armstrong

Bloom's Taxonomy

create — **Produce new or original work**
Design, assemble, construct, conjecture, develop, formulate, author, investigate

evaluate — **Justify a stand or decision**
appraise, argue, defend, judge, select, support, value, critique, weigh

analyze — **Draw connections among ideas**
differentiate, organize, relate, compare, contrast, distinguish, examine, experiment, question, test

apply — **Use information in new situations**
execute, implement, solve, use, demonstrate, interpret, operate, schedule, sketch

understand — **Explain ideas or concepts**
classify, describe, discuss, explain, identify, locate, recognize, report, select, translate

remember — **Recall facts and basic concepts**
define, duplicate, list, memorize, repeat, state

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Background Information

In 1956, Benjamin Bloom with collaborators Max Englehart, Edward Furst, Walter Hill, and David Krathwohl published a framework for categorizing educational goals: *Taxonomy of Educational Objectives*. Familiarly known as Bloom's Taxonomy, this framework has been applied by generations of K-12 teachers and college instructors in their teaching.

The framework elaborated by Bloom and his collaborators consisted of six major categories: Knowledge, Comprehension, Application, Analysis, Synthesis, and Evaluation. The categories after Knowledge were presented as "skills and abilities," with the understanding that knowledge was the necessary precondition for putting these skills and abilities into practice.

While each category contained subcategories, all lying along a continuum from simple to complex and concrete to abstract, the taxonomy is popularly remembered according to the six main categories.

The Original Taxonomy (1956)

Here are the authors' brief explanations of these main categories in from the appendix of *Taxonomy of Educational Objectives* (*Handbook One*, pp. 201-207):

- **Knowledge** "involves the recall of specifics and universals, the recall of methods and processes, or the recall of a pattern, structure, or setting."

- **Comprehension** "refers to a type of understanding or apprehension such that the individual knows what is being communicated and can make use of the material or idea being communicated without necessarily relating it to other material or seeing its fullest implications."

- **Application** refers to the "use of abstractions in particular and concrete situations."

- **Analysis** represents the "breakdown of a communication into its constituent elements or parts such that the relative hierarchy of ideas is made clear and/or the relations between ideas expressed are made explicit."

- **Synthesis** involves the "putting together of elements and parts so as to form a whole."

- **Evaluation** engenders "judgments about the value of material and methods for given purposes."

The 1984 edition of *Handbook One* is available in the CFT Library in Calhoun 116. See its ACORN record for call number and availability.

While many explanations of Bloom's Taxonomy and examples of its applications are readily available on the Internet, this guide to Bloom's Taxonomy is particularly useful because it contains links to dozens of other web sites.

Barbara Gross Davis, in the "Asking Questions" chapter of *Tools for Teaching*, also provides examples of questions corresponding to the six categories. This chapter is not available in the online version of the book, but *Tools for Teaching* is available in the CFT Library. See its ACORN record for call number and availability.

The Revised Taxonomy (2001)

A group of cognitive psychologists, curriculum theorists and instructional researchers, and testing and assessment specialists published in 2001 a revision of Bloom's Taxonomy with the title *A Taxonomy for Teaching, Learning, and Assessment*. This title draws attention away from the somewhat static notion of "educational objectives" (in Bloom's original title) and points to a more dynamic conception of classification.

The authors of the revised taxonomy underscore this dynamism, using verbs and gerunds to label their categories and subcategories (rather than the nouns of the original taxonomy). These "action words" describe the cognitive processes by which thinkers encounter and work with knowledge:

- Remember
  - Recognizing
  - Recalling
- Understand
  - Interpreting
  - Exemplifying
  - Classifying
  - Summarizing
  - Inferring
  - Comparing
  - Explaining
- Apply
  - Executing
  - Implementing
- Analyze
  - Differentiating
  - Organizing
  - Attributing
- Evaluate
  - Checking
  - Critiquing
- Create
  - Generating
  - Planning
  - Producing

In the revised taxonomy, knowledge is at the basis of these six cognitive processes, but its authors created a separate taxonomy of the types of knowledge used in cognition:

- Factual Knowledge
  - Knowledge of terminology
  - Knowledge of specific details and elements
- Conceptual Knowledge
  - Knowledge of classifications and categories
  - Knowledge of principles and generalizations
  - Knowledge of theories, models, and structures
- Procedural Knowledge
  - Knowledge of subject-specific skills and algorithms
  - Knowledge of subject-specific techniques and methods
  - Knowledge of criteria for determining when to use appropriate procedures
- Metacognitive Knowledge
  - Strategic Knowledge
  - Knowledge about cognitive tasks, including appropriate contextual and conditional knowledge
  - Self-knowledge

Mary Forehand from the University of Georgia provides a guide to the revised version giving a brief summary of the revised taxonomy and a helpful table of the six cognitive processes and four types of knowledge.

Why Use Bloom's Taxonomy?

The authors of the revised taxonomy suggest a multi-layered answer to this question, to which the author of this teaching guide has added some clarifying points:

1. Objectives (learning goals) are important to establish in a pedagogical interchange so that teachers and students alike understand the purpose of that interchange.
2. Teachers can benefit from using frameworks to organize objectives because
3. Organizing objectives helps to clarify objectives for themselves and for students.
4. Having an organized set of objectives helps teachers to:
   - "plan and deliver appropriate instruction";
   - "design valid assessment tasks and strategies";and
   - "ensure that instruction and assessment are aligned with the objectives."

Citations are from *A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives*.

Further Information

Section III of *A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives*, entitled "The Taxonomy in Use," provides over 150 pages of examples of applications of the taxonomy. Although these examples are from the K-12 setting, they are easily adaptable to the university setting.

Section IV, "The Taxonomy in Perspective," provides information about 19 alternative frameworks to Bloom's Taxonomy, and discusses the relationship of these alternative frameworks to the revised Bloom's Taxonomy.