A Model of Learning Objectives

based on

A Taxonomy for Learning, Teaching, and Assessing:
A Revision of Bloom's Taxonomy of Educational Objectives

Among other modifications, Anderson and Krathwohl's (2001) revision of the original Bloom's taxonomy (Bloom & Krathwohl, 1956) redefines the cognitive domain as the intersection of the Cognitive Process Dimension and the Knowledge Dimension. This document offers a three-dimensional representation of the revised taxonomy of the cognitive domain.

Although the Cognitive Process and Knowledge dimensions are represented as hierarchical steps, the distinctions between categories are not always clear-cut. For example, all procedural knowledge is not necessarily more abstract than all conceptual knowledge; and an objective that involves analyzing or evaluating may require thinking skills that are no less complex than one that involves creating. It is generally understood, nonetheless, that lower order thinking skills are subsumed by, and provide the foundation for higher order thinking skills.

The Knowledge Dimension classifies four types of knowledge that learners may be expected to acquire or construct—ranging from concrete to abstract (Table 1).

Table 1. The Knowledge Dimension – major types and subtypes

concrete knowledge			abstract knowledge
factual	conceptual	procedural	metacognitive*
knowledge of terminology	knowledge of classifications and categories	knowledge of subject-specific skills and algorithms	strategic knowledge
knowledge of specific details and elements	knowledge of principles and generalizations	knowledge of subject-specific techniques and methods	knowledge about cognitive tasks, including appropriate contextual and conditional knowledge
	knowledge of theories, models, and structures	knowledge of criteria for determining when to use appropriate procedures	self-knowledge

(Table 1 adapted from Anderson and Krathwohl, 2001, p. 46.)
*Metacognitive knowledge is a special case. In this model, "metacognitive knowledge is knowledge of [one's own] cognition and about oneself in relation to various subject matters . . ." (Anderson and Krathwohl, 2001, p. 44).

This taxonomy provides a framework for determining and clarifying learning *objectives*. Learning *activities* often involve both lower order and higher order thinking skills as well as a mix of concrete and abstract knowledge.

The Cognitive Process Dimension

The Cognitive Process Dimension represents a continuum of increasing cognitive complexity—from lower order thinking skills to higher order thinking skills. Anderson and Krathwohl (2001) identify nineteen specific cognitive processes that further clarify the scope of the six categories (Table 2).

Table 2. The Cognitive Processes dimension — categories & cognitive processes and alternative names

lower order thinking skills ——————————————→ higher order thinking skills

remember	understand	apply	analyze	evaluate	create
recognizing • identifying recalling • retrieving	interpreting • clarifying • paraphrasing • representing • translating exemplifying • illustrating • instantiating classifying • categorizing • subsuming summarizing • abstracting • generalizing inferring • concluding • extrapolating • interpolating • predicting comparing • contrasting • mapping • matching explaining • constructing models	executing • carrying out implementing • using	differentiating • discriminating • distinguishing • focusing • selecting organizing • finding coherence • integrating • outlining • parsing • structuring attributing • deconstructing	checking • coordinating • detecting • monitoring • testing critiquing • judging	generating • hypothesizing planning • designing producing • constructing

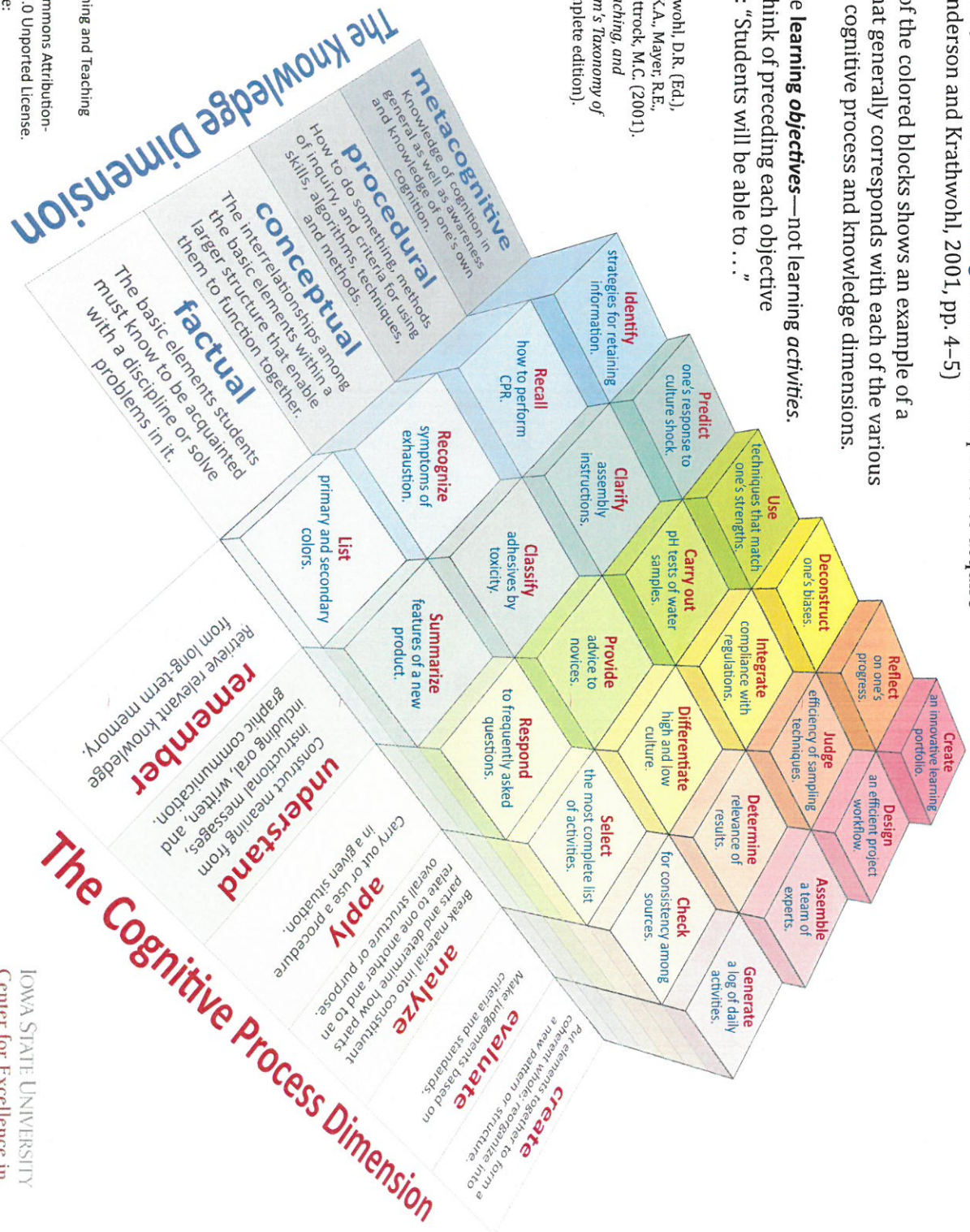(Table 2 adapted from Anderson and Krathwohl, 2001, pp. 67–68.)

A statement of a **learning objective** contains a **verb** (an action) and an **object** (usually a noun).

- The **verb** generally refers to [actions associated with] the intended **cognitive process**.
- The **object** generally describes the **knowledge** students are expected to acquire or construct. (Anderson and Krathwohl, 2001, pp. 4–5)

In this model, each of the colored blocks shows an example of a learning objective that generally corresponds with each of the various combinations of the cognitive process and knowledge dimensions.

Remember: these are learning *objectives*—not learning *activities*. It may be useful to think of preceding each objective with something like: "Students will be able to . . ."

*Anderson, L.W. (Ed.), Krathwohl, D.R. (Ed.), Airasian, P.W., Cruikshank, K.A., Mayer, R.E., Pintrich, P.R., Raths, J., & Wittrock, M.C. (2001). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's Taxonomy of Educational Objectives* (Complete edition). New York: Longman.

The Knowledge Dimension

metacognitive
Knowledge of cognition in general as well as awareness and knowledge of one's own cognition.

procedural
How to do something, methods of inquiry, and criteria for using skills, algorithms, techniques, and methods.

conceptual
The interrelationships among the basic elements within a larger structure that enable them to function together.

factual
The basic elements students must know to be acquainted with a discipline or solve problems in it.

The Cognitive Process Dimension

remember
Retrieve relevant knowledge from long-term memory.

understand
Construct meaning from instructional messages, including oral, written, and graphic communication.

apply
Carry out or use a procedure in a given situation.

analyze
Break material into constituent parts and determine how parts relate to one another and to an overall structure or purpose.

evaluate
Make judgments based on criteria and standards.

create
Put elements together to form a coherent or functional whole; reorganize into a new pattern or structure.

Identify strategies for retaining information.

Recall how to perform CPR.

Recognize symptoms of exhaustion.

List primary and secondary colors.

Predict one's response to culture shock.

Clarify assembly instructions.

Classify adhesives by toxicity.

Summarize features of a new product.

Use techniques that match one's strengths.

Carry out pH tests of water samples.

Provide advice to novices.

Respond to frequently asked questions.

Deconstruct one's biases.

Integrate compliance with regulations.

Differentiate high and low culture.

Select the most complete list of activities.

Reflect on one's progress.

Judge efficiency of sampling techniques.

Determine relevance of results.

Check for consistency among sources.

Create an innovative learning portfolio.

Design an efficient project workflow.

Assemble a team of experts.

Generate a log of daily activities.