

Anderson and Krathwohl

Bloom's Taxonomy Revised

Understanding the New Version of Bloom's Taxonomy

©Leslie Owen Wilson (2016, 2013, 2005, 2001) [Contact Leslie](#)

A succinct discussion of the revisions to Bloom's classic cognitive taxonomy by Anderson and Krathwohl and how to use them effectively

Background:

Who are Anderson and Krathwohl? These gentlemen are the primary authors of the revisions to what had become known as *Bloom's Taxonomy* — an ordering of cognitive skills. (**A taxonomy is really just a word for a form of classification.**) This taxonomy had permeated teaching and instructional planning for almost 50 years before it was revised in 2001. And although these crucial revisions were published in 2001, surprisingly there are still educators who have never heard of Anderson and Krathwohl or their important work in relation to Bloom's Cognitive Taxonomy. Both of these primary authors were in a perfect position to orchestrate looking at the classic taxonomy critically. They called together a group of educational psychologists and educators to help them with the revisions. Lorin Anderson was once a student of the famed Benjamin Bloom, and David Krathwohl was one of Bloom's partners as he devised his classic cognitive taxonomy.

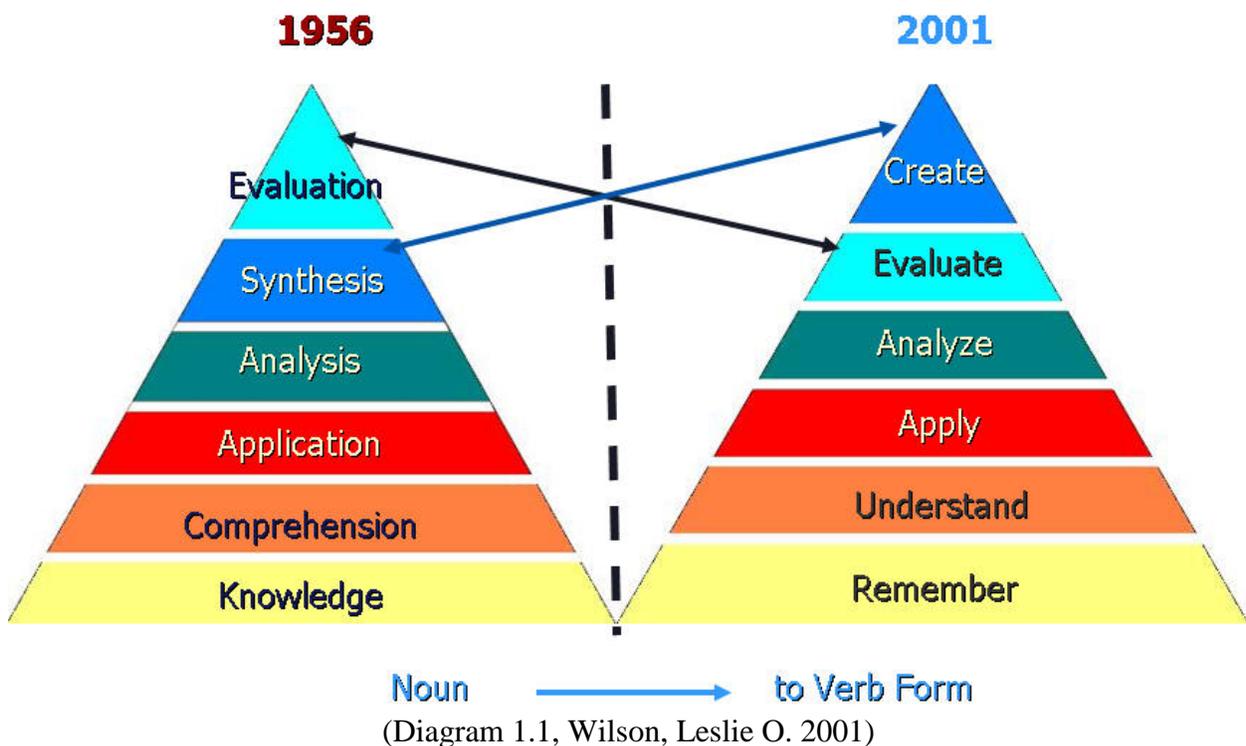
Here in the United States, from the late 1950s into the early 1970s, there were attempts to dissect and classify the varied domains of human learning – cognitive (knowing, or head), affective (emotions, feelings, or heart) and psychomotor (doing, or kinesthetic, tactile, haptic or hand/body). The resulting efforts yielded a series of taxonomies for each area. The aforementioned taxonomies deal with the varied aspects of human learning and were arranged hierarchically, proceeding from the simplest functions to those that are more complex. Bloom's Cognitive Taxonomy had been a staple in teacher training and professional preparation for almost 40 years before Anderson and Krathwohl instituted an updated version. An overview of those changes appears below.

While all of the taxonomies above have been defined and used for many years, there came about at the beginning of the 21st century in a new version of the **cognitive** taxonomy, known commonly before as Bloom's Taxonomy. You can also search the Web for varied references on the other two taxonomies — affective or psychomotor. There are many valuable discussions on the development of all the of the hierarchies, as well as examples of their usefulness and applications in teaching. However, it is important to note that in a number of these discussions, some web authors have mislabeled the affective and psychomotor domains as extensions of Bloom's work. These authors are in grave error. The original cognitive domain was described and published in 1956. While David Krathwohl was one of the original authors on this taxonomy the work was named after the senior or first author Benjamin Bloom. The affective domain was

6. Evaluation: The ability to judge, check, and even critique the value of material for a given purpose.
Examples of verbs that relate to this function are:
 judge assess argue decide validate consider
 compare evaluate choose rate select appraise value
 conclude measure estimate criticize infer
 deduce

6. Creating:
 Putting elements together to form a coherent or functional whole; reorganizing elements into a new pattern or structure through generating, planning, or producing. Creating requires users to put parts together in a new way, or synthesize parts into something new and different creating a new form or product. This process is the most difficult mental function in the new taxonomy.

Table 1.1 – Bloom vs. Anderson/Krathwohl



Note: Bloom’s taxonomy revised – the author critically examines his own work – After creating the cognitive taxonomy one of the weaknesses noted by Bloom himself was that there is a fundamental difference between his “knowledge” category and the other 5 levels of his model as those levels dealt with intellectual abilities and skills in relation to interactions with **types of knowledge**. Bloom was very aware that there was an acute difference between

knowledge and the mental and intellectual operations performed on, or with, that knowledge. He identified specific types of knowledge as:

- Terminology
- Specific facts
- Conventions
- Trends and sequences
- Classifications and categories
- Criteria
- Methodology
- Principles and generalizations
- Theories and structures

Levels of Knowledge – The first three of these levels were identified in the original work, but rarely discussed or introduced when initially discussing uses for the taxonomy. **Metacognition** was added in the revised version.

- **Factual Knowledge** – The basic elements students must know to be acquainted with a discipline or solve problems.
- **Conceptual Knowledge** – The interrelationships among the basic elements within a larger structure that enable them to function together.
- **Procedural Knowledge** – How to do something, methods of inquiry, and criteria for using skills, algorithms, techniques, and methods.
- **Metacognitive Knowledge** – Knowledge of cognition in general, as well as awareness and knowledge of one's own cognition. (29)

(Summarized from: Anderson, L. W. & Krathwohl, D.R., et al (2001) *A taxonomy for learning, teaching and assessing: A revision of Bloom's taxonomy of educational objectives*. New York: Longman.)

One of the things that clearly differentiates the new model from that of the 1956 original is that it lays out components nicely so they can be considered and used. Cognitive processes, as related to chosen instructional tasks, can be easily documented and tracked. This feature has the potential to make teacher assessment, teacher self-assessment, and student assessment easier or clearer as usage patterns emerge. (See PDF link below for a sample.)

As stated before, perhaps surprisingly, these levels of knowledge were indicated in Bloom's original work – *factual, conceptual, and procedural* – but these were never fully understood or used by teachers because most of what educators were given in training consisted of a simple chart with the listing of levels and related accompanying verbs. The full breadth of *Handbook I*, and its recommendations on types of knowledge, were rarely discussed in any instructive or useful way. Another rather gross lapse in common teacher training over the past 50+ years is teachers-in-training are rarely made aware of any of the criticisms leveled against Bloom's original model.

Please note that in the updated version the term “*metacognitive*” has been added to the array of knowledge types. For readers not familiar with this term, it means *thinking about ones thinking in a purposeful way* so that one knows about cognition and also knows how to regulate one’s cognition.

The Knowledge Dimensions	Cognitive Processes					
	1. Remember	2. Understand	3. Apply	4. Analyze	5. Evaluate	6. Create
Factual						
Conceptual						
Procedural						
Metacognitive						

Knowledge Dimensions Defined:

Factual Knowledge is knowledge that is basic to specific disciplines. This dimension refers to essential facts, terminology, details or elements students must know or be familiar with in order to understand a discipline or solve a problem in it.

Conceptual Knowledge is knowledge of classifications, principles, generalizations, theories, models, or structures pertinent to a particular disciplinary area.

Procedural Knowledge refers to information or knowledge that helps students to do something specific to a discipline, subject, or area of study. It also refers to methods of inquiry, very specific or finite skills, algorithms, techniques, and particular methodologies.

Metacognitive Knowledge is the awareness of one’s own cognition and particular cognitive processes. It is strategic or reflective knowledge about how to go about solving problems, cognitive tasks, to include contextual and conditional knowledge and knowledge of self.

Sources:

Anderson, L. W. and Krathwohl, D. R., et al (Eds.) (2001) *A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives*. Allyn & Bacon. Boston, MA (Pearson Education Group) **[**There is a newer \(2013\), abridged, less expensive version of this work.](#)**

Bloom, B.S. and Krathwohl, D. R. (1956) *Taxonomy of Educational Objectives: The Classification of Educational Goals*, by a committee of college and university examiners. Handbook I: Cognitive Domain. NY, NY: Longmans, Green

Krathwohl, D. R. (2002) [A Revision of Bloom's Taxonomy. \(PDF\) in Theory into Practice. V 41. #4. Autumn, 2002.](#) Ohio State University. Retrieved @

- Wilson's PDF [anderson-and-krathwohl-revised-10-2016](#)
- Wilson's PDF [Example of using revised taxonomy](#)

The Anderson/Krathwohl text has numerous examples of how these concepts can be used for K-12 teachers. Since I have used this material in my teaching (a special topics graduate course on taxonomies and their uses entitled *Beyond Bloom's*,) and have also presented on this topic in several national conferences, **I have artifacts and examples of how these revisions can be used effectively in college teaching. While I have a link above to an artifact, to be fully understood you might need to view the original assignment and the supportive documents. I would be happy to provide those and discuss them more fully. I am always happy to share information with other educators.**