Learning Outcome Taxonomies

Knowledge is multi-faceted and multi-layered. Taxonomies, or classifications, have been developed to help categorize the different kinds, depths, and locations of learning. These taxonomies aid us in defining how different kinds of knowledge require different instructional strategies or assessments.

Taxonomies of learning usually come in one of three varieties. First, you can organize the many facets of learning from the perspective of the student. Is the learning about what the students *know*, what they can *do,* or what they are *becoming*? This kind of **domain taxonomy** helps you focus on the whole student, not just the student's brain.

Next there are **taxonomies of level** that explore the levels of knowledge. Such taxonomies guide you in helping students reach greater depth or complexity of understanding.

Lastly are **taxonomies of kind.** These help identify the different types of thinking or the many purposes of the thought that constitute student learning.

- **Taxonomies of Learning by Domain.** One of the most common systems for thinking about learning and knowledge is to organize it according to *where the learner experiences it,* the domain. Some learning is clearly mostly about the *mind*. Other learning, however, resides in the student's *value center*, in the judgments or choices that they make based on grounds other than simple rationality. Yet some learning can be thought of as residing in one's *bodies* or *skills* (the piano player whose knowledge of the music is in her fingers). Taxonomies of domain are often therefore split thus:

To Know	To Be	To Do

  While this taxonomy has shown up in many forms, there have been instructive consistencies. For example, this simple model reminds one that acquiring skill (Do) is different from gathering knowledge (Know) and that both rely on integration of learning into a values system—into the life of an individual (Be).
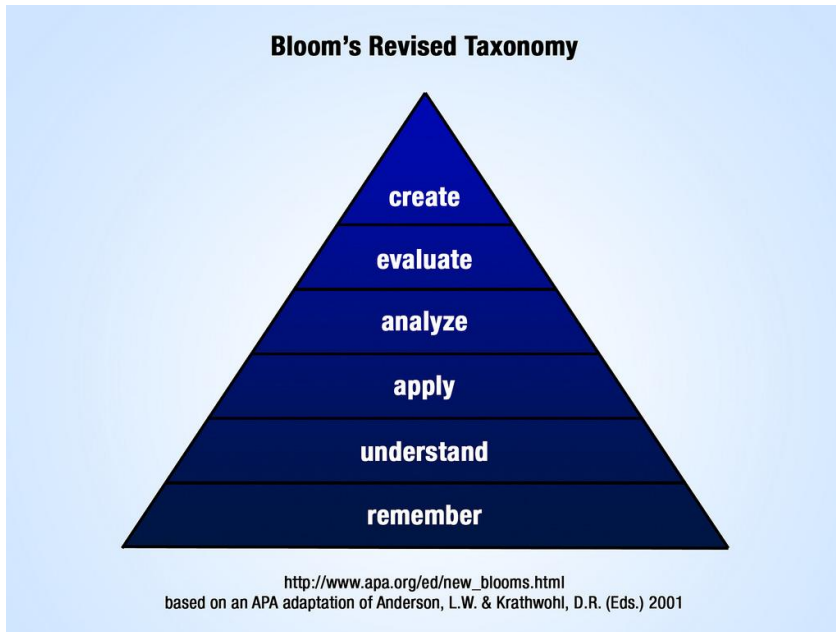
  This taxonomy also reminds one that all learning has a personal or affective component (Be) which must be addressed if an instructor hopes to be effective. Further, implicitly asks the question: Why are students learning this? What can they *do* with it?

  Once students have mastered a body of knowledge, the taxonomy reminds us to turn attention to how that knowledge impacts the students, how they react to it, or the choices they'd make as a result. Then instruction turns to application of the concepts. In each case, learning has to happen in all the domains. It is never monolithic; it needs to be integrated into a life rather than just a brain.

- **Taxonomies of Learning by Level.** Another means of organizing learning is to categorize it by the *complexity* and *depth* of the cognitive process required. Such taxonomies allow you to think about student learning *sequentially*, as advancing from one level to the next, more complex level. The most well-known taxonomy of this type is Bloom's taxonomy of cognitive outcomes.

Bloom's Revised Taxonomy

create

evaluate

analyze

apply

understand

remember

http://www.apa.org/ed/new_blooms.html
based on an APA adaptation of Anderson, L.W. & Krathwohl, D.R. (Eds.) 2001

Bloom reminds us that cognitive learning describes a spectrum of activities from simple remembering (knowledge), through useful *application* of the information, to nuanced *evaluation* based on larger, value-laden contexts. With Bloom in mind, it is easier to create a sequence of activities that leads a student from one cognitive process to the next.

Level	Instructional Methods	Assessment
Knowledge	Before-class assignment	Reading quiz
Comprehension	Discussion	Restate main idea in own words
Application	Group work on examples	Develop a strategy to . . .
Analysis	Lab experience	Explain why x happened. . .
Synthesis	Student demonstrations	Predict the change if . . .
Evaluation	Class Lincoln/Douglas debate	Support your suggestion for a better solution to . . .

This example of Bloom is not meant as an endorsement of this taxonomy over others. No taxonomy is "correct" or universal. Different instructors find different taxonomies of greater or lesser relative value as they think about defining outcomes and designing assessments.

- **Taxonomies of Learning by Kind.** Educators often conceive of learning by the type of knowledge generated. For example, learning the vocabulary of a new language is **factual knowledge** and requires

instructional methods that emphasize memorization. Learning grammar, however, is **conceptual knowledge** and requires focus on capturing abstract relationships. Knowing how to put words and grammar together to express ideas in a conversation is **procedural knowledge**. And learning about how you best learn languages, or self-awareness about one's own knowing, is **meta-cognitive knowledge.**

Taxonomies give educators a systematic way to think about learning. It is extremely helpful for instructors to memorize some taxonomies that seem well-adapted to their respective disciplines and teaching goals. The memorized taxonomies help not only in defining outcomes, but in formulating questions, and in designing instruction.

- **Use multiple methods.** No single learning outcome can or should be taught with a single instructional method. Yet some methods lend themselves better than others in accomplishing certain outcomes. Think through the relationship between the outcomes you've identified and the methods you propose using a taxonomy as your guide.
- **Don't get tied down.** All of these taxonomies are ways of structuring thinking. Don't feel that you need to develop outcomes to fit every aspect of a taxonomy. The important thing is to consider learning outcomes in holistic terms.
- **Start simply.** No course can be all things to all people. Pick two or three outcomes for each taxonomy level to insure depth, and one or two domains to insure penetration and retention. When identifying learning outcomes, starting with domain taxonomies is generally easiest.