Bloom's Revised Taxonomy

Bloom's Taxonomy is named for educational theorist Benjamin Bloom who, along with his team of assessment experts, developed a taxonomy to describe how people come to learn and know. As Anderson & Krathwohl (2001) explain, "A taxonomy is a special kind of framework. In a taxonomy the categories lie along a continuum" (p. 4) as a way of organizing, in this case, how we can think about cognitive process.

The taxonomy is organized into six categories of thinking skills ranging from lower order thinking skills (LOTS), such as remembering, understanding and applying, to higher order thinking skills (HOTS), including analyzing, evaluating, and creating.

The taxonomy is a great tool for helping students improve their learning. Students who actively engage in more complex thinking develop the habits-of-mind to study efficiently and productively. Intentionally incorporating multiple levels of thinking skills empowers students to develop critical thinking, which is foundational to sound judgement, original thought and creativity.

Action	Definition	Associated Cognitive Processes
Creating	"putting elements together to form a coherent functional whole"	Generating Planning Producing
Evaluating	"making judgements based on criteria and standards"	Checking Critiquing
Analyzing	"breaking material into its constituent parts and determining how the parts are related to one another and to an overall structure"	Differentiating Organizing Attributing
Applying	"using procedures to perform [tasks] or solve problems"	Executing Implementing
Understanding	"build[ing] connections between the 'new' knowledge to be gained and their prior knowledge"	Interpreting Summarizing Inferring Explaining
Remembering	"retrieving relevant knowledge from long-term memory"	Recognizing Recalling

Table 1. Bloom's Revised Taxonomy adapted from *A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives*, abridged edition, by L. W. Anderson & D. R. Krathwohl, Eds., 2001, pp.66-85.

Development

The action verbs described within the taxonomy correspond to the six cognitive processes that lead toward the highest levels of thinking. Each action has unique characteristics and outcomes that enable the progression from one level to the next in the quest for higher order thinking. For instance, recall of information is necessary, yet alone, it is insufficient for higher order thinking.

To develop higher order thinking skills, students must be able to recall relevant information from long term memory and make sense of it. Only then can students apply this knowledge in their own work. They become increasingly competent in understanding, applying, analyzing, and evaluating concepts.

At the analyzing level, students are able to deconstruct, simplify, and understand complexity in the context of how one part relates to another. Students who are able to effectively and efficiently analyze information acquire the necessary skills to go on to evaluate, decide, judge, and ultimately synthesize information into something new.

Creating is the highest and most complex learning outcome identified in Bloom's Revised Taxonomy. In order to achieve the higher order thinking skills of synthesis and innovation, that is putting things together and creating something new, students are using all the other thinking skills in the framework beginning with gaining factual knowledge, moving to conceptual and procedural understanding through comprehension, application, analysis, and evaluation, before ultimately arriving at synthesis and creation.

Why this matters

Bloom's Taxonomy is a useful model to help students understand how deeper thinking improves learning.

When students develop their metacognition, that is their awareness of how they are learning, they are able to identify how cognition and the regulation of cognition are essential to optimizing learning. Through the self-regulation of learning skills, strategies, and habits, students can study more efficiently and to better prepare for exams. By identifying course learning outcomes outlined by the instructor, students can better identify and analyze learning goals and expectations to efficiently create their study plan.

Each level of Bloom's Taxonomy is presented as a separate one page resource within this series. For more discussion and explanation of metacognition, refer to our Metacognition handout.

Reference

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