**Total Participation Techniques**

*by Pérsida Himmele and William Himmele*

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**Appendix: Bloom's Cognitive Taxonomy**

More than 50 years ago, Benjamin Bloom and his colleagues (1956) developed a cognitive taxonomy (or classification system) of educational objectives. It was simple and enabled teachers to understand the depth and cognitive intensity they were asking of students with regard to their educational goals. Although it was developed so many years ago, Bloom's taxonomy still remains a simple and useful tool for helping teachers develop deep and meaningful learning goals for students.

Bloom's taxonomy has six levels, divided into *lower-order thinking* and *higher-order thinking*. The lower-order thinking classifications consist of Knowledge, Comprehension, and Application. The higher-order thinking classifications consist of Analysis, Synthesis, and Evaluation. The difference between the two is significant, because with lower-order thinking, students are not asked to cognitively create anything new, or to make connections to life, or to understand deep implications of the concepts for society or themselves, or in relation to other content learned. They are simply asked to demonstrate that they heard the teacher or understood enough of what the teacher said in order to give it back to the teacher. Lower-order thinking may involve applying what they learned, but not in the same way that Synthesis requires (see description that follows). With lower-order thinking, the teacher provides all the abstractions. But higher-order thinking requires students to stretch. The teacher is asking them to deliver the abstractions. For example, with lower-order thinking, a teacher might ask, "What is the legislative policy that determines how many children a couple can have in China?" With higher-order thinking, a teacher might ask, "Based on what you know regarding the differing government systems in the United States and China, how might people in each country respond differently to their lawmakers creating a one-child policy? Be prepared to explain why you think each population would respond this way, basing your explanation on what you've learned about the two systems of government." The second set of questions is going to require quite a bit more flexing of cognitive muscle than the first, which simply requires that students recall what they were told.

The following sections describe each of the six levels of Bloom's cognitive taxonomy.

Lower-Order Thinking

**Knowledge** refers to "remembering, either by recognition or recall" (Bloom et al., 1956, p. 62). It usually takes only a few words to answer a question aimed at knowledge, and the answer does not require any connection making on the part of the learners. They're simply giving you back what you taught them. For example, you might ask, "How many sides does a hexagon have?"

**Comprehension** refers to the ability to understand what was taught. It is also simply a "giving back" to the teacher of what was taught. Students are not required to understand the concept deeply, or to understand the relationships within what they've learned. They just need to be able to summarize it or retell it. For example, you might ask, "What was the story about?"

**Application** refers to "the use of abstractions in particular and concrete situations" (p. 205). With goals aimed at the application level, students are simply using or applying what you taught them. Application still does not require them to develop abstractions of their own. For example, if you're teaching the area of a rectangle, Application might involve asking students to simply plug in numbers using an abstract formula that you gave them. The learning becomes Synthesis, a higher-order thinking classification, when they develop their own formulas (abstractions) that are new to them (even if these formulas aren't new to you).

Higher-Order Thinking

**Analysis** refers to "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 the ideas expressed are made explicit" (p. 205). To analyze, students have to understand the nuances within a concept. They have to be able to make connections between ideas and look at how these ideas affect each other. The higher-order question mentioned earlier, regarding the one-child policy, requires an analysis of communism and democracy and how each affects people's opinions and reactions to government control on private life.

**Synthesis** refers to "the putting together of elements and parts so as to form a whole. This involves the process of working with pieces, parts, elements, etc., and arranging and combining them in such a way as to constitute a pattern or structure not clearly there before" (p. 206). The key with Synthesis is that the abstraction, pattern, or new structure comes from the student, not the teacher (see the earlier Application example for mathematics).

**Evaluation** refers to "quantitative and qualitative judgments about the extent to which material and methods satisfy criteria" (p. 207). It does not simply refer to students giving their opinion. For the task to qualify as Evaluation, the judgment has to make use of and be based upon learned material. The higher-order question regarding the one-child policy also requires an evaluation based on what students have learned regarding communism and democracy.

For a more in-depth analysis of higher-order thinking, with additional strategies for reaching higher-order thinking through content reading strategies and visual scaffolds, see our earlier ASCD book, *The Language-Rich Classroom: A Research-Based Framework for Teaching English Language Learners* (Himmele & Himmele, 2009).