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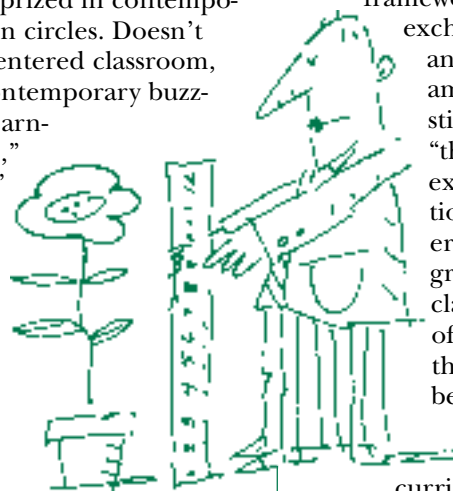
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Creating a Blueprint for the Constructivist Classroom

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Given its early associations with behaviorism, programmed instruction, and mastery learning, skeptics may question the claim that Bloom's taxonomy is a useful tool for creating the learner-centered classroom so prized in contemporary education circles. Doesn't the learner-centered classroom, along with contemporary buzzwords like "learning paradigm," "constructivism," and "critical thinking," arise out of cognitive approaches to learning? And aren't these approaches directly opposed to behaviorist principles of learning based on the simple cause-and-effect behaviors of chickens pecking levers for food pellets? Whatever its origins, Bloom's taxonomy offers a promising approach for designing classroom experiences for students, experiences that promote critical thinking and constructivist approaches to learning.



Bloom's Taxonomy: What It Is and How It Came About

For a project with such sustained and widespread influence, the taxonomy had an austere beginning. At the 1948 convention of the American Psychological Association in Boston, an informal meeting of college examiners proposed the development of a theoretical

framework "to promote the exchange of test materials and ideas about testing" among institutions and stimulate research on "the relations between examining and education." After some deliberation, however, the group decided that a classification of the goals of education would suit their purposes best, because educational objectives are "the basis for building curricula and tests" (p. 4).

Mindful of the standard set by traditional, scientific taxonomies, they further qualified the taxonomy as a seemingly paradoxical classification of "intellectual behaviors" that represented the intended outcomes of the educational process.

The method the group used to create the taxonomy was straightforward. They collected educational objectives from the curricula of

their own institutions. For each objective, they separated the intended behavior from the content or object of the behavior, and then tried to classify the behaviors into categories ranging from the simple to the complex. They looked in vain for a comprehensive psychological theory of learning to inform the developing scheme. In the end the group settled instead on a series of checks of communicability and comprehensiveness to verify the major categories of the taxonomy.

In its final form, Bloom's *Taxonomy of the Cognitive Domain* comprises six levels of intellectual behaviors: knowledge, comprehension, application, analysis, synthesis, and evaluation. These levels progress from the simplest, *knowledge* ("the remembering, either by recognition or recall, of ideas, materials, and phenomena" [p. 62]) to the most complex, *evaluation* ("the making of judgments about the value, for some purpose, of ideas, works, solutions, methods, material, etc.." [p. 185]).

Creating a Learner-Centered Classroom

The preconceptions of most students about the nature of teaching and learning and the practices of a majority of instructors are in stark contrast to the demands of the constructivist classroom. According to William Perry's *Scheme of Intellectual Development*, the typical first-year college student has a dualistic view of knowledge, believing that right answers for everything exist in the absolute and that the role of the instructor is to teach them. Knowledge represents a gradual accretion of right answers acquired through effort and obedience to the instructor. Sadly, traditional teaching practices, particularly in introductory courses, tend to reinforce, rather than challenge, this unsophisticated epistemology and view of learning. Traditional approaches emphasize the presentation of information, and define learning as its absorption. In this

scheme, teaching excellence equals sound academic knowledge, extensive content coverage, and polished presentation skills. Excellence in learning equals the flawless recall and summary of information.

In contrast, an effective student-centered, learning-oriented classroom requires different perspectives from both instructors and students. Rather than covering content, the goal of instruction becomes the intentional intellectual development of students. This involves changing the way students think and encouraging them to confront what they believe in light of facts and evidence. At the same time, students must significantly alter their view of knowledge, the role of instructors, and themselves as learners. Moving from dualism to a more sophisticated relativist perspective, students begin to understand that *knowledge is context dependent* and that we can judge the merits of ideas, information, and values based on criteria. Increasingly, they view their own role as learning to think independently and the instructors' as the facilitation of that process.

Focus on Student Learning

Bloom's taxonomy represents a tool for planning and implementing the student-centered classroom, because it gives teachers a precise language for articulating the intended outcomes of their instruction expressed in terms of student learning. It also offers instructors a tool for decoupling critical thinking skills from content, the primary emphasis of instruction in the traditional classroom. As a result, the focus of classroom instruction becomes the acquisition of student skills and competencies rather than the instructor's academic knowledge or content coverage. Further, by specifying outcomes that display different levels of learning, the taxonomy offers a refinement over the behavioral objective alone. Behavioral objectives provided

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May

Editor's Note:

Tom Creed, technology editor and TECHPED columnist for the *Forum*, died March 8th of liver cancer. We spoke by phone several times in the week before he died, and in the weeks since his passing I have thought continually about him, his meaning in my life and in the life of this publication. In a conversation with Ted Marchese, editor of CHANGE magazine, about "teacher enthusiasm," I finally realized Tom's essential character. "Enthusiasm" only seemed to describe him; "joy" got to the heart of it. Enthusiasm comes and goes; joy of the kind Tom had "never faileth." His boundless energy, his eagerness to explore how we might teach better as we come to understand the new technologies at our disposal, began and ended in his joy of learning. He saw teaching as the most exalted fun one could have, because it helped learning along its ever-unwinding path. The TECHPED column he created will continue, as will the [Virtual Companions](#) he prepared to accompany each column on the *Forum's* Web site. (They are all archived in the Web site's [library section](#).) Tom would be glad to know that what he started will go on. He would be touched to know how very sharply he is missed.

• • •

Many readers will know the work of the **Carnegie Foundation for the Advancement of Teaching**. Its reports have influenced the conversational agenda in education for many years. But you may not know the variety of new programs that have recently been started at Carnegie under the foundation's current president, Lee Shulman. With underwriting support from the foundation, this issue of the *Forum* offers the first of two special sections of independent coverage devoted to the new work now in progress, and how it may influence the conversation in the decades ahead.

This issue inaugurates another new feature, "Ad Rem," which (more or less) is Latin for "get on with it." **Linc. Fisch**, a familiar voice in faculty development circles, contributes the first of these short, practical items designed to have plug-and-play utility.

Virginia Lee offers the first of two articles on the famous *Taxonomy of Educational Objectives* by Benjamin Bloom, et al. Written in the 1950s, the *Taxonomy* has proven one of the most durable and useful tools around. Here, Lee suggests ways it can lend precision to course design as well as assessment.

Following from recent articles in the *Forum* (including "[Pygmalion in the Classroom](#)," V8, N2), **Steve Rose** offers a scheme for empirically assessing a teacher's equitable and effective classroom performance within the context of such well-established good practices as "latency," "attentive listening," "precise encouragement," and the like.

Ron Cramer profiles a large Abnormal Psychology class that feels like an intimate discussion thanks to good pedagogy and improved technology. Focusing on a TA who wouldn't believe his teaching was less than perfect, **Laura Border's** DEVELOPER'S DIARY argues that there's little excuse for not improving one's teaching with so many helpful resources available.

Finally, **Taddy Kalas** offers an important corrective to an excessive focus on the student's voice. In this LEARNING DIARY, Kalas tells a moving story of how in trying to give her students voice, she denied them access to something valuable, something only she could bring into her classroom, *her* voice.

Tom Creed
1947-1999



In loving memory

instructors a way to state learning outcomes precisely: for example, "to design a college-level course utilizing at least five levels of Bloom's taxonomy" rather than the fuzzier "to understand Bloom's taxonomy." Coupled with behavioral objectives, cognitive levels allow instructors to mark out for students a path to the achievement of overarching course goals such as the design of a course: for example, "to *state* the six levels of Bloom's taxonomy," "to *identify* the level of a given behavioral objective," "to *write* a behavioral objective at each of the six levels of the taxonomy," "to *formulate* a set of goals for a college course and six associated objectives," and finally, "to *design* a course using Bloom's taxonomy." Consequently, teaching becomes an intentional activity in which instructors guide students and isolate learning difficulties along the way before those difficulties hinder the mastery of important course outcomes.

Student learning outcomes expressed at various levels of Bloom's taxonomy become the foundation for the selection and design of assignments (including examinations), teaching strategies, readings, and instructional materials such as technology.

An Operational Definition of Critical Thinking

Interestingly, as information proliferates and becomes obsolete more rapidly, calls to promote students' ability to "think critically" have intensified. Information becomes less important than the ability to select and weigh it, to discriminate, and to evaluate competing knowledge claims. At the same time there is little consensus concerning what critical thinking is or how to teach it, except perhaps by modeling it. But the taxonomy provides an operational definition of critical thinking that instructors can use to promote this mental faculty and to communicate it explicitly to their students. Bloom's definition is

—James Rhem

consistent with several respected conceptualizations of critical thinking, including the following by Joanne Kurfiss: "... an investigation whose purpose is to explore a situation, phenomenon, question, or problem to arrive at a hypothesis or conclusion about it that integrates all available information and that therefore can be convincingly justified." In essence, the six levels of the taxonomy describe broad categories of strategies for conducting such an investigation: for example, identifying and defining issues or problems, determining the kinds of information relevant to solving the problem, generating hypotheses, constructing arguments, making inferences, and evaluating results.

A Framework for Knowledge Construction

According to constructivism, a popular theme in contemporary education circles based on central findings in cognitive psychology, learners do not acquire knowledge passively but construct it actively based on their experiences. Efforts to incorporate constructivist approaches to learning in the postsecondary classroom usually involve the use of active learning strategies such as group work, discussion, case studies, problem-based learning, and the like. If students are active—or so the reasoning goes—then they are somehow also constructing knowledge. What is frequently lacking, however, is a firm understanding of what knowledge construction really is, its relationship to course content, and how instructors should go about teaching it. According to an educational model developed by Bob Gowin, knowledge construction begins with current knowledge represented as concepts, principles, and theories. Through a process of inquiry (formalized in academic disciplines as methods of inquiry), we transform empirical evidence (e.g., natural phenomena, historical events, human behavior) into revised and new knowledge

The Six Major Levels of Bloom's Taxonomy of the Cognitive Domain (with representative behaviors and sample objectives)

- I. **Knowledge.** Remembering information
Define, identify, label, state, list, match
 - Identify the standard peripheral components of a computer
 - Write the equation for the Ideal Gas Law
 - Identify the five major prophets of the Old Testament
- II. **Comprehension.** Explaining the meaning of information
Describe, generalize, paraphrase, summarize, estimate
 - In one sentence explain the main idea of a written passage
 - Describe in prose what is shown in graph form
 - Translate the following passage from *The Iliad* into English
- III. **Application.** Using abstractions in concrete situations
Determine, chart, implement, prepare, solve, use, develop
 - Using principles of operant conditioning, train a rat to press a bar
 - Apply shading to produce depth in drawing
 - Derive a kinetic model from experimental data
- IV. **Analysis.** Breaking down a whole into component parts
Points out, differentiate, distinguish, discriminate, compare
 - Compare and contrast the major assumptions underlying psychoanalytic and humanistic approaches to psychology
 - Identify supporting evidence to support the interpretation of a literary passage
 - Analyze an oscillator circuit and determine the frequency of oscillation
- V. **Synthesis.** Putting parts together to form a new and integrated whole
Create, design, plan, organize, generate, write
 - Write a logically organized essay in favor of euthanasia
 - Develop an individualized nutrition program for a diabetic patient
 - Compose a choral work using four-part harmony for men's and women's voices
- VI. **Evaluation.** Making judgments about the merits of ideas, materials, or phenomena
Appraise, critique, judge, weigh, evaluate, select
 - Assess the appropriateness of an author's conclusions based on the evidence given
 - Select the best proposal for a proposed water treatment plant
 - Evaluate a work of art using appropriate terminology

structures. The six levels of Bloom's taxonomy reflect not only the importance of acquiring information (i.e., Level 1: Knowledge) but also the intellectual processes of application, analysis, synthesis, and evaluation by which we transform raw data into formalized knowledge structures. Utilizing the taxonomy during the instructional planning stage, teachers can establish the ability to *construct knowledge* as a meaningful student learning outcome and embed its practice explicitly into the essential components of their courses (e.g., classroom instruction, evaluation).

A Blueprint for the Constructivist Classroom

Using the taxonomy, instructors can create a detailed blueprint of a student-centered learning environment that fosters critical thinking and the process of knowledge construction. The blueprint becomes the foundation for all

future planning at the course, unit, and individual lesson levels. It also facilitates the design of rewarding learning experiences for students, the identification of student learning difficulties, and the assessment of the impact of our teaching on student learning. Although developed in the heyday of behaviorism, Bloom's taxonomy has proven itself a flexible and enduring structure to help define the parameters of the constructivist classroom, lend rigor to the teaching of critical thinking skills, and guide purposeful learning in contemporary postsecondary teaching environments. ■■

Subscribers: Find examples of course syllabi constructed using the taxonomy and a full-size, downloadable copy of the taxonomy sheet in the supplemental materials for this article on the Forum's Web site (www.nltf.com).

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