

Although its usefulness and influence in education is probably unsurpassed, Bloom's Taxonomy has limitations when it comes to developing critical thinking curriculums.

Bloom's Taxonomy and Critical Thinking Instruction

RICHARD W. PAUL

It would be difficult to find a more influential work in education today than *The Taxonomy of Educational Objectives* (Bloom and others, 1979). Developed by a committee of college and university examiners from 1949 to 1954 and published as two handbooks—*Cognitive Domain* and *Affective Domain*—its objectives were manifold. Handbook I, *Cognitive Domain*, for instance, lists four encompassing objectives:

1. To "provide for classification of the goals of our educational system ... to be of general help to all teachers, administrators, professional specialists, and research workers who deal with curricular and evaluation problems ... to help them discuss these problems with greater precision...."

2. To "be a source of constructive help ... in building a curriculum...."

3. To "help one gain a perspective on the emphasis given to certain behaviors...."

4. To "specify objectives so that it becomes easier to plan learning experiences and prepare evaluation devices...." (pp. 1, 2).

The authors note as well that the categories of the Taxonomy (Figure 1) can be used "as a framework for viewing the educational process and analyzing its workings" and even for "analyzing teachers' success in classroom teaching" (p. 3).

A generation of teachers have now come of age not only familiar with and "acceptant" of the general categories of the Taxonomy, but also persuaded that the Taxonomy's identified higher-order skills of analysis, synthesis, and evaluation are essential to education at



all levels. For these teachers, critical thinking is essential because higher-order skills are essential. To learn how to think critically, in this view, is to learn how to ask and answer questions of analysis, synthesis, and evaluation.

To help teachers incorporate critical thinking in the classroom is to help

Richard W. Paul is Director, Center for Critical Thinking and Moral Critique, Sonoma State University, Rohnert Park, California.

them ask questions that call for analysis, synthesis, and evaluation. In this view, then, learning to teach critical thinking is quite straightforward. The thinking of the teacher does not need to be significantly altered, and no fundamental shifts in educational philosophy are required. The Taxonomy and the ability to generate a full variety of question types are all that an intelligent teacher really needs to teach critical thinking skills.

This view is significantly misleading. According to most advocates of critical thinking, there is no neat set of recipes for fostering critical thinking in students. The single most useful thing a teacher can do is to take at least one well-designed college course in critical thinking, in which the *teacher's own* thinking skills are analyzed and nurtured in a variety of ways. In other words, teachers should have a solid foundation in critical thinking skills if they are expected to teach them.

What follows is a succinct analysis and critique of Bloom's Taxonomy, from the perspective of the values and epistemological presuppositions of the critical thinking movement. I hope it will contribute to a deeper understanding of the nature and demands of critical thinking instruction.

A One-Way Hierarchy

Though not designed to further critical thinking instruction as such, *Cognitive Domain* contains a wealth of information of use in such instruction. Reading it in its entirety is most rewarding, particularly the sections on analysis, synthesis, and evaluation. These sections disclose that most of

the cognitive processes characterized as essential to higher-order questions in fact presuppose use of the basic concepts of critical thinking: assumption, fact, concept, value, conclusion, premise, evidence, relevant, irrelevant, consistent, inconsistent, implication, fallacy, argument, inference, point of view, bias, prejudice, authority, hypothesis, and so forth. This is clear, for example, in the explanation of analysis:

Skill in analysis may be found as an objective of any field of study. It is frequently expressed as one of their important objectives by teachers of science, social studies, philosophy, and the arts. They wish, for example, to develop in students the ability to distinguish fact from hypothesis in a communication, to identify conclusions and supporting statements, to distinguish relevant from extraneous material, to note how one idea relates to another, to see what unstated assumptions are involved in what is said, to distinguish dominant from subordinate ideas or themes in poetry or music, to find evidence of the author's techniques and purposes. . . . (*Cognitive Domain*, p. 144)

In other words, if the ability to analyze typically requires students to do such things as distinguish facts from hypotheses, conclusions from evidence, relevant from irrelevant material, to note how one concept relates to another, to probe and detect unstated assumptions, then it seems essential that students become not only familiar with these words (by teachers introducing them frequently into classroom discussion) but also comfortable with using them as they think their way through analytic problems. This need becomes more evident if we recognize that by analysis, synthesis, and evaluation, the authors of the Tax-

onomy have in mind only *explicit* (not subconscious) uses of them. They rightly emphasize what has become a virtual platitude in cognitive psychology—that students (and experts) who do the best analyses, syntheses, and evaluations tend to do them mindfully with a clear sense of their component elements. So, if the concepts of critical thinking are presupposed in mindful analysis, synthesis, and evaluation, we can best heighten that mindfulness by raising those component concepts to a conscious level.

Similarly, value *neutrality* is implied in *Affective Domain* although many of the examples of higher-order valuing are illustrations of values intrinsic to education conceived on a critical thinking paradigm, ones in which a student:

Deliberately examines a variety of viewpoints on controversial issues with a view to forming opinions about them.

[Develops] faith in the power of reason in methods of experimental discussion.

Weights alternative social policies and practices against the standards of the public welfare rather than the advantage of specialized and narrow interest groups.

[Achieves] readiness to revise judgments and to change behavior in the light of evidence.

Judges problems and issues in terms of situations, issues, purposes, and consequences involved rather than in terms of fixed, dogmatic precepts or emotionally wishful thinking.

Develops a consistent philosophy of life (pp. 181-185).

Along with the usefulness of Bloom's Cognitive and Affective Taxonomies, it is important to bear in mind their limitations for critical thinking curriculum construction. To

some extent the Taxonomies represent an attempt to achieve the impossible: a perfectly neutral classification of cognitive and affective processes that makes no educational value judgments and favors no educational philosophy over any other—one that could be used by any culture, nation, or system whatsoever, independent of its specific values or world view:

... to avoid partiality to one view of education as opposed to another, we have attempted to make the taxonomy neutral by avoiding terms which implicitly convey value judgments and by making the taxonomy as conclusive as possible. This means that the kinds of behavioral changes emphasized by any institution, educational unit, or educational philosophy can be represented in the classification. Another way of saying this is that any objective which describes an intended behavior should be classifiable in this system (*Cognitive Domain*, p. 14).

This approach to knowledge, cognition, and education is in part irreconcilable with a commitment to critical thinking skills, abilities, and dispositions:

To a large extent, knowledge as taught in American schools depends upon some external authority; some expert or group of experts is the arbiter of knowledge (*Cognitive Domain*, p. 31).

... the scheme does provide levels for the extreme inculcation of a prescribed set of values if this is the philosophy of the culture (*Affective Domain*, p. 43).

It is possible to imagine a society or culture which is relatively fixed. Such a society represents a closed system in which it is possible to predict in advance both the kinds of problems individuals will encounter and the solutions which are appropriate to those problems. Where such predictions can be made in advance, it is possible to organize the educational experience so as to give each individual the particular knowledge and specific methods needed for solving the problems he will encounter (*Cognitive Domain*, p. 39, 40).

But it is precisely because of this attempt at neutrality that, for example, the category of "knowledge" is analyzed in such a restricted way and the relationship of the categories is assumed to be hierarchical in only one direction. For instance, according to Bloom's Taxonomy, "comprehension" presupposes "knowledge," but "knowledge" does not presuppose "comprehension." The second of these conceptual decisions would be questioned by those who hold that the basic skills and dispositions of critical thinking need to be brought into schooling at

the very beginning, and that for any learning to occur, they must be intrinsic to every element of it.

Knowledge as an Achievement

The critical thinking movement can be traced back to the practice and vision of Socrates, who 2,400 years ago discovered by a probing method of questioning that many authorities of his day could not justify on rational grounds their confident claims to knowledge. Confused meanings, inadequate evidence, or self-contradictory beliefs were often lurking beneath smooth but largely empty rhetoric. This gave rise to a fundamental insight into the problem of human irrationality and to a view of knowledge and learning which holds that beliefs and assents without reason, judgment, and understanding behind them on the part of the learner are for that learner mere prejudices. This belief is central to the critical thinking movement. This view holds as well, therefore, the corollary principle that critical thinking reflection on the part of each and every learner is an essential precondition of knowledge. Put another way, those who advocate critical thinking instruction hold that knowledge is not something that can be given by one person to another. It cannot simply be memorized out of a book or taken whole cloth from the mind of another. Knowledge, rightly understood, is viewed as a distinctive construction by the learner, something that issues out of a rational use of mental processes.

To expect students to assent before they have developed the capacity to do so rationally is to indoctrinate rather than to educate them and to foster habits of thought antithetical to the educative process. Peter Kneidler (1985) observed "an unfortunate tendency to teach facts in isolation from the thinking skills"—to give students knowledge and sometime later expect them to think about it. Knowledge, in any defensible sense, is an achievement requiring a mind that is slow rather than quick to believe—which waits for, expects, and weighs evidence before moving to belief. The earlier a mind begins to develop rational scruples, in this view, the better.

As Quine and Ullian (1970) put it:

... knowledge is in some ways like a good golf score: each is substantially the fruit of something else, and there are no magic shortcuts to either one. To improve

your golf score you work at perfecting the various strokes; for knowledge you work at garnering and sifting evidence and sharpening your reasoning skills. Knowledge is no more guaranteed than is a lowered golf score, but there is no better way (p. 13).

We don't actually know whether students have achieved some knowledge until we have verified whether their beliefs represent something they actually know (have rationally assented to) or are merely something they have memorized in order to repeat on a test. Dewey, as the authors of the Taxonomy recognize, illustrated this point with the following story in which he asked a class:

"What would you find if you dug a hole in the earth?" Getting no response, he repeated the question; again he obtained nothing but silence. The teacher chided Dr. Dewey, "You're asking the wrong question." Turning to the class, she asked, "What is the state of the center of the earth?" The class replied in unison, "Ignorant fusion."

The writers of the Taxonomy attempt to side-step this problem by defining "knowledge" as "what is currently known or accepted by the experts or specialists in a field, whether or not such knowledge, in a philosophical sense, corresponds to 'reality'" (*Cognitive Domain*, p. 32).

The writers of the Taxonomy erroneously assume that the only issue here is the relative value of the knowledge, not whether what is simply memorized is properly to be called knowledge at all.

In these latter conceptions [those which link knowledge to understanding and rational assent] it is implicitly assumed that knowledge is of little value if it cannot be utilized in new situations or in a form very different from that in which it was originally encountered. The denotations of these latter concepts would usually be close to what have been defined as "abilities and skills" in the taxonomy (*Cognitive Domain*, p. 29).

This inadvertently begs the question as to whether blindly memorized true belief can properly be called knowledge at all—and hence whether inculcation and indoctrination into true belief is properly to be called education. If knowledge of any kind is to some extent a skilled, rational achievement, then we ought not to confuse knowledge and education with belief inculcation and indoctrination, just as we ought not to confuse learning (we learn, are not born with, bias, prejudices, and misconceptions, for exam-

ple) with the acquisition of knowledge. This point, which is crucial for the critical thinking movement, was well formulated by John Henry Newman (1852):

... knowledge is not a mere extrinsic or accidental advantage, ... which may be got up from a book, and easily forgotten again, ... which we can borrow for the occasion, and carry about in our hand [it is] something intellectual ... which reasons upon what it sees ... the action of a formative power ... making the objects of our knowledge subjectively our own.

The reduction ad absurdum of the view that knowledge can be distinguished from comprehension and rational assent is suggested by William Graham Sumner (1906), one of the founding fathers of anthropology, commenting on the failure of the schools of his day:

The examination papers show the pet ideas of the examiners. An orthodoxy is produced in regard to all the great doctrines. It consists in the most worn and commonplace opinions. It is intensely provincial and philistine ... [containing] broad fallacies, half-truths, and glib generalizations ... children [are] taught just that one thing which is "right" in the view and interest of those in control and nothing else.

Clearly, Sumner's point is that beliefs that are provincial, fallacious, or misleading should not be viewed as knowledge at all, however widely they are treated as such, and the process by which this inculcation is accomplished should not be viewed as education, however widely it is described as such.

Rational Learning

To sum up, the authors of the Taxonomy organized cognitive processes into a one-way hierarchy, leading readers to conclude that knowledge is always a simpler behavior than comprehension, comprehension a simpler behavior than application, application a simpler behavior than analysis, and so forth through synthesis and evaluation. However, this view is misleading in at least one significant sense: the achieving of any knowledge always presupposes at least minimal comprehension, application, analysis, synthesis, and evaluation. This counter-insight is essential for well-planned and realistic curriculum designed to foster critical thinking skills, abilities, and dispositions, and it cannot be achieved without the development of critical thinking skills on the part of the teacher.

From the very outset, for any learning, we should anticipate and encourage those rational scruples realistically within the range of student grasp, a strategy that requires critical insight into the evidentiary foundation of the learning we are attempting to foster. We should scrutinize our instructional strategies lest we inadvertently nurture student *irrationality*, as we do when we encourage students to believe what—from the perspective of their own thinking—they have no rational reason to believe. If we want rational learning (and again, *not all learning is rational*), then the process that leads to belief is more important than belief itself. There is nothing that we come to believe that we haven't in some sense *judged* to be credible. If a student believes something just because we or the text assert it, he learns to accept blindly.

Right-answer inculcation is not a preliminary step to critical thought. It is a procedure that nurtures irrational belief and unnecessarily generates a mindset that must be broken down when and if rational learning and knowledge acquisition are to begin. The structure of our lifelong learning is typically grounded in our early cognitive habits. If they are irrationally based, then they are likely to remain so. There are two twin obstacles to the development of rational learning: (1) being told, and coming to expect to be told, what to believe (belief inculcation); and (2) being told, and coming to expect to be told, precisely what to do (the over-proceduralization of thought). Together they fatally undermine independence of thought.

Bloom's Taxonomy, all of the above notwithstanding, is a remarkable tour de force, a ground-breaking work filled with seminal insights into cognitive processes and their interrelations. Nevertheless, the attempt to remain neutral with respect to all educational values and philosophies issues is a one-sided hierarchical analysis of cognitive processes that limits our insight into the nature of critical thinking.¹ Successful critical thinking instruction requires that:

- That teachers have a full range of insights into cognitive processes and their complex interrelationships.
- That Bloom's hierarchy become two-sided.
- That teachers grasp that rational

learning is *process*—rather than *product*-oriented—a process that brings comprehension, analysis, synthesis, and evaluation into every act of the mind that involves the acceptance, however provisional, of beliefs or claims to truth, and that fosters thereby *rational* habits of thought and *rational* learning.

the teacher's primary job is that of making clear the bases upon which he weighs the facts, the methods by which he separates facts from fancies, and the ways in which he discovers and selects his ultimate norms. ... This concept of teaching ... requires that the purported facts be accompanied by the reasons why they are considered the facts. Thereby the teacher exposes his methods of reasoning to test and change. If the facts are in dispute ... then the reasons why others do not consider them to be facts must also be presented, thus bringing alternative ways of thinking and believing into dialogue with each other.

—Emerson Shideler

¹To minimize misunderstanding let me express in another way one basic sense in which I consider it misleading to call Bloom's Taxonomy "neutral." By labeling the first category "knowledge" rather than "rote recall," the Taxonomy legitimates calling the product of rote recall "knowledge." Such labeling is educationally tendentious and therefore not neutral.

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Benjamin Bloom replies:

We intended the Taxonomy as a method of classifying educational objectives, educational experiences, learning processes, and evaluation questions and problems. We did not intend to provide a constraint on educational philosophy, teaching methods, or curriculum development.

Benjamin S. Bloom is Charles H. Swift Distinguished Service Professor (Emeritus), The University of Chicago.

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